



Imperial encyclopedia
and dictionary



SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(·) is the mark dividing words respelt phonetically into syllables; ('), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
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<i>ā</i> ...	mate, fate, fail, aye.....	<i>māt, fāt, fāl, ā.</i>
<i>ă</i> ...	mat, fat.....	<i>măt, făt.</i>
<i>â</i> ...	far, calm, father.....	<i>fâr, kām, fâ' thēr.</i>
<i>ă</i> ...	care, fair.....	<i>cār, fār.</i>
<i>aw</i> ...	fall, laud, law.....	<i>farol, lawod, law.</i>
<i>ē</i> ...	mete, meat, feet, free.....	<i>mēt, mêt, fêt, frē.</i>
<i>ě</i> ...	met, bed.....	<i>mět, bēd.</i>
<i>é</i> ...	her, stir, heard, cur.....	<i>hēr, stēr, hērd, kēr.</i>
<i>î</i> ...	pine, ply, height.....	<i>pîn, plî, hît.</i>
<i>ï</i> ...	pin, nymph, ability.....	<i>pîn, nîmf, â-bîl'î-tî.</i>
<i>ō</i> ...	note, toll, soul.....	<i>nôt, tōl, sōl.</i>
<i>ö</i> ...	not, plot.....	<i>nôt, plôt.</i>
<i>ô</i> ...	move, smooth.....	<i>môv, smôth.</i>
<i>ö</i> ...	Goethe (similar to <i>e</i> in her)...	<i>gö'tēh.</i>
<i>ow</i> ...	noun, bough, cow.....	<i>noun, bow, kow.</i>
<i>oy</i> ...	boy, boil.....	<i>boy, boyl.</i>
<i>û</i> ...	pure, dew, few.....	<i>pûr, dû, fû.</i>
<i>ÿ</i> ...	bud, come, tough.....	<i>bûd, kûm, tûf.</i>
<i>û</i> ...	full, push, good.....	<i>fûl, pûsh, gûd.</i>
<i>ü</i> ...	French plume, Scotch guid.....	<i>plûm, gûd.</i>
<i>ch</i> ...	chair, match.....	<i>châr, mäch.</i>
<i>ch</i> ...	German buch, Heidelberg, Scotch loch (guttural).....	<i>böch, hî'del-tērçh, löch.</i>
<i>g</i> ...	game, go, gun.....	<i>gām, gō, gûn.</i>
<i>j</i> ...	judge, gem, gin.....	<i>jûj, jēm, jîn.</i>
<i>k</i> ...	king, cat, cot, cut.....	<i>kîng, kât, kôt, kût.</i>
<i>s</i> ...	sit, scene, cell, city, cypress.....	<i>sît, sēn, sèl, sît'î, sî'prēs.</i>
<i>sh</i> ...	shun, ambition.....	<i>shûn, âm-bîsh'ûn.</i>
<i>th</i> ...	thing, breath.....	<i>thîng, brēth.</i>
<i>th</i> ...	though, breathe.....	<i>thō, brēth.</i>
<i>z</i> ...	zeal, maze, muse.....	<i>zēl, māz, mûz.</i>
<i>zh</i> ...	azure, vision.....	<i>âzh'er, vîâh'ûn.</i>

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ABBREVIATIONS USED IN THIS WORK.

a, or adj....adjective
A.B.....Bachelor of Arts
abbr.....abbreviation, abbreviated
abl. or abla.ablative
Abp.....Archbishop
abt.....about
Acad.....Academy
acc. or ac..accusative
accom.....accommodated, accommodation
act.....active
A.D..in the year of our Lord [*Anno Domini*]
Adj.Adjutant
Adm.....Admiral
adv. or ad..adverb
A. F.....Anglo-French
Ag.....Silver [*Argentum*]
agri.....agriculture
A. L.....Anglo-Latin
Al.....Aluminium
Ala.....Alabama
Alb.....Albanian
alg.....algebra
A.M.....before noon [*ante meridiem*]
A.M.Master of Arts
Am.....Amos
Amer.....America, -n
anat.....anatomy, anatomical
anc.....ancient, anciently
AN. M..in the year of the world [*Anno Mundi*]
anon.....anonymous
antiqu.....antiquity, antiquities
aor'.....aorist, -ic
app.....appendix
appar.....apparently
Apr.....April
Ar.....Arabic
arch.....architecture
archæol....archæology
arith.....arithmetic
Ariz.....Arizona
Ark.....Arkansas
art.....article
artil.....artillery
AS.....Anglo-Saxon
As.....Arsenic
Assoc.....Association
asst.....assistant
astrol.....astrology
astron... ..astronomy
attrib.....attributive
atry.....attorney
at. wt.....atomic weight
Au.....Gold [*Aurum*]

A.U.C.....in the year of the building of the city (Rome)[*Annourbis conditæ*]
Aug.....August
aug.....augmentative
Aust.....Austrian
A. V.....authorized version [of Bible, 1611]
avoir.....avoirduois
B.....Boron
B.....Britannic
b.....boon
Ba.....Barium
Bart.....Baronet
Bav.....Bavarian
bl.; bbl....barrel; barrels
B.C.....before Christ
B.C.L.... ..Bachelor of Civil Law
B.D.....Bachelor of Divinity
bef.....before
Belg.....Belgie
Beng.....Bengali
Bi.....Bismuth
biog.....biography, biographical
biol.....biology
B.L.....Bachelor of Laws
Bohem....Bohemian
bot.....botany, botanical
Bp.....Bishop
Br.....Bromine
Braz.....Brazilian
Bret.....Breton
Brig.....Brigadier
Brit.....British, Britannica
bro.....brother
Bulg.....Bulgarian
bush.....bushel, bushels
C.....Carbon
c.....century
Ca.....Calcium
Cal.....California
Camb.....Cambridge
Can.....Canada
Cant.....Canterbury
cap.....capital
Capt.....Captain
Card.....Cardinal
carp.....carpentry
Cath.....Catholic
caus.....causative
cav.....cavalry
Cd.....Cadmium
Ce.....Cerium
Celt.....Celtic
cent.....central
cf.....compare [*confer*]
ch or chh...church

ABBREVIATIONS.

Chal.....	Chaldee	diff.....	different, difference
chap.....	chapter	dim.....	diminutive
chem.....	chemistry, chemical	dist.....	district
Chin.....	Chinese	distrib.....	distributive
Chron.....	Chronicles	div.....	division
chron.....	chronology	doz.....	dozen
Cl.....	Chlorine	Dr.....	Doctor
Class.....	Classical [= Greek and Latin]	dr.....	dram, drams
Co.....	Cobalt	dram.....	dramatic
Co.....	Company	Dut. or D.....	Dutch
co.....	county	dwt.....	pennyweight
cog.....	cognate [with]	dynam or	
Col.....	Colonel	dyn.....	dynamics
Col.....	Colossians	E.....	Erbium
Coll.....	College	E. or e.....	East, -ern, -ward
colloq.....	colloquial	E. or Eng.....	English
Colo.....	Colorado	Eccl.....	Ecclesiastes
Com.....	Commodore	eccl. or	ecclesiastical [affairs]
com.....	commerce, commercial	eccles.....	
com.....	common	ed.....	edited, edition, editor
comp.....	compare	e.g.....	for example [ex gratia]
comp.....	composition, compound	E. Ind. or	East Indies, East Indian
compar.....	comparative	E. I.....	
conch.....	conchology	elect.....	electricity
cong.....	congress	Emp.....	Emperor
Congl.....	Congregational	Encyc.....	Encyclopedia
conj.....	conjunction	Eng. or E.....	English
Conn or Ct.....	Connecticut	engin.....	engineering
contr.....	contraction, contracted	entom.....	entomology
Cop.....	Coptic	env. ext.....	envoy extraordinary
Cor.....	Corinthians	ep.....	epistle
Corn.....	Cornish	Eph.....	Ephesians
corr.....	corresponding	Episc.....	Episcopal
Cr.....	Chromium	eq. or =.....	equal, equals
crystal.....	crystallography	equiv.....	equivalent
Cs.....	Cæsium	esp.....	especially
ct.....	cent	Est.....	Esther
Ct. or Conn.....	Connecticut	estab.....	established
Cu.....	Copper [Cuprum]	Esthon.....	Esthonian
cwt.....	a hundred weight	etc.....	and others like [et cetera]
Cyc.....	Cyclopedia	Eth.....	Ethiopic
D.....	Didymium	ethnog.....	ethnography
D. or Dut.....	Dutch	ethnol.....	ethnology
d.....	died	et seq.....	and the following [et sequentia]
d. [l. s. d.].....	penny, pence	etym.....	etymology
Dan.....	Daniel	Eur.....	European
Dan.....	Danish	Ex.....	Exodus
dat.....	dative	exclam.....	exclamation
dau.....	daughter	Ezek.....	Ezekiel
D. C.....	District of Columbia	Ezr.....	Ezra
D.C.L.....	Doctor of Civil [or Common] Law	F.....	Fluorine
D.D.....	Doctor of Divinity	F. or Fahr.....	Fahrenheit
Dec.....	December	f. or fem.....	feminine
dec.....	declension	F. or Fr.....	French
def.....	definite, definition	fa.....	father
deg.....	degree, degrees	Fahr. or F.....	Fahrenheit
Del.....	Delaware	far.....	farriery
del.....	delegate, delegates	Fe.....	Iron [Ferrum]
dem.....	democratic	Feb.....	February
dep.....	deputy	fem or f.....	feminine
dep.....	deponent	fig.....	figure, figuratively
dept.....	department	Fin.....	Finnish
deriv.....	derivation, derivative	F.—L.....	French from Latin
Deut.....	Deuteronomy	Fla.....	Florida
dial.....	dialect, dialectal	Flem.....	Flemish
diam.....	diameter	for.....	foreign
Dic.....	Dictionary	fort.....	fortification
		Fr. or F.....	French
		fr.....	from

ABBREVIATIONS.

freq.....frequentative	ind.....indicative
Fris.....Frisian	indef.....indefinite
ft.....foot, feet	Indo-Eur...Indo-European
fut.....future	inf.....infantry
G. or Ger...German	inf or infin.infinite
G.....Glucinium	instr.....instrument, -al
Ga.....Gallium	int... ..interest
Ga.....Georgia	intens.....intensive
Gael.....Gaelic	interj. or
Gal.....Galatians	int.....interjection
gal.....gallon	interrog...interrogative pro-
galv.....galvanism, galvanic	noun
gard.....gardening	intr. or
gen.....gender	intrans...intransitive
Gen.....General	Io.....Iowa
Gen.....Genesis	Ir.....Iridium
gen.....genitive	Ir.....Irish
Geno.....Genoese	Iran.....Iranian
geog... ..geography	irr.....irregular, -ly
geol.....geology	Is.....Isaiah
geom.....geometry	It.....Italian
Ger.....German, Germany	Jan.....January
Goth.....Gothic	Jap.....Japanese
Gov.....Governor	Jas.....James
govt.....government	Jer.....Jeremiah
Gr.....Grand, Great	Jn.....John
Gr.....Greek	Josh.....Joshua
gr.....grain, grains	Jr.....Junior
gram.....grammar	Judg.....Judges
Gr. Brit...Great Britain	K.....Potassium [<i>Kallum</i>]
Gris... ..Grisons	K.....Kings [in Bible]
gun.....gunnery	K.....king
H.....Hegira	Kan.....Kansas
H.....Hydrogen	Kt.....Knight
h.....hour, hours	Ky.....Kentucky
Hab.....Habakkuk	L.....Latin
Hag.....Haggai	L.....Lithium
H. B. M....His [or Her] Britan- nic Majesty	l. [l. s. d.], } pound, pounds or £..... } [sterling]
Heb.....Hebrew, Hebrews	La.....Lanthanum
her.....heraldry	La.....Louisiana
herpet.....herpetology	Lam.....Lamentations
Hg.....Mercury [<i>Hydrar- gyrum</i>]	Lang.....Languedoc
hhd.....hog's head, hogsheads	lang... ..language
Hind.....Hindustani, Hindu, or Hindi	Lap.....Lapland
hist.....history, historical	lat.....latitude
Hon.....Honorable	lb.; llb. or } pound; pounds lbs..... } [weight]
hort.....horticulture	Let.....Lettish
Hos.....Hosea	Lev.....Leviticus
Hung.....Hungarian	LG.....Low German
Hydros.....Hydrostatics	L.H.D.....Doctor of Polite Lit- erature
I.....Iodine	Lieut.....Lieutenant
I; Is.....Island; Islands	Lim.....Limousin
IceL.....Icelandic	Lin.....Linnæus, Linnæan
ichth.....ichthyology	lit.....literal, -ly
Ida.....Idaho	lit.....literature
i.e.....that is [<i>id est</i>]	Lith.....Lithuanian
Ill.....Illinois	lithog.....lithograph, -y
illus.....illustration	LL.....Late Latin, Low Latin
impera or	LL.D.....Doctor of Laws
impr.....imperative	long.....longitude
impers.....impersonal	Luth.....Lutheran
imp for imp imperfect	M.....Middle
impf. p. or	M.....Monsieur
imp.....imperfect participle	m.....mile, miles
improp.....improperly	m. or masc.masculine
ln.....Indium	M.A.....Master of Arts
in... ..inch, inches	Macc... ..Maccabees
incept.....inceptive	mach... ..machinery
Ind.....India, Indian	Mag.....Magazine
Ind.....Indiana	

ABBREVIATIONS.

Maj.....	Major	N. A., or	
Mal.....	Malachi	N. Amer.	North America, -n
Mal.....	Malay, Malayan	nat.....	natural
manuf.....	manufacturing, manufacturers	naut.....	nautical
Mar.....	March	nav.....	navigation, naval af- fairs
masc or m.	masculine	Nb.....	Niobium
Mass.....	Massachusetts	N. C. or	
math	mathematics, math- ematical	N. Car...	North Carolina
Matt.....	Matthew	N. D.....	North Dakota
M.D.....	Doctor of Medicine	Neb.....	Nebraska
MD.....	Middle Dutch	neg.....	negative
Md.....	Maryland	Neh.....	Nehemiah
ME.....	Middle English, or Old English	N. Eng....	New England
Me.....	Maine	neut or n...	neuter
mech.....	mechanics, mechan- ical	Nev.....	Nevada
med.....	medicine, medical	N.Gr.....	New Greek, Modern Greek
mem.....	member	N. H	New Hampshire
mensur....	mensuration	NHG.....	New High German [German]
Messrs. or		Ni	Nickel
MM	Gentlemen, Sirs	N. J.....	New Jersey
metal.....	metallurgy	NL.....	New Latin, Modern Latin
metaph....	metaphysics, meta- physical	N. Mex....	New Mexico
meteor....	meteorology	N. T., or	
Meth.....	Methodist	N. Test...	New Testament
Mex.....	Mexican	N. Y.....	New York [State]
Mg	Magnesium	nom.....	nominate
M.Gr	Middle Greek	Norm. F...	Norman French
MHG.....	Middle High Ger- man	North. E ..	Northern English
Mic.....	Micah	Norw... ..	Norwegian, Norse
Mich	Michigan	Nov.....	November
mid.....	middle [voice]	Num.....	Numbers
Milan.....	Milanese	numis.....	numismatics
mid. L. or }	Middle Latin, Me-	O.....	Ohio
ML..... }	diæval Latin	O.....	Old
milit. or		O.....	Oxygen
mil....	military [affairs]	Obad.....	Obadiah
min	minute, minutes	obj.....	objective
mineral....	mineralogy	obs. or †...	obsolete
Minn	Minnesota	obsoles....	obsolescent
Min. Plen.	Minister Plenipoten- tiary	O.Bulg....	Old Bulgarian or Old Slavic
Miss.....	Mississippi	Oct.....	October
ML. or }	Middle Latin, Me-	Odontog...	odontography
mid. L... }	diæval Latin	OE.....	Old English
MLG.....	Middle Low German	OF or	
Mlle.....	Mademoiselle	O. Fr....	Old French
Mme.....	Madam	OHG.....	Old High German
Mn.....	Manganese	Ont.....	Ontario
Mo.....	Missouri	opt... ..	optics, optical
Mo.....	Molybdenum	Or.....	Oregon
mod.....	modern	ord	order
Mont.....	Montana	ord....	ordnance
Mr.....	Master [Mister]	org.....	organic
Mrs.....	Mistress [Missis]	orig.....	original, -ly
MS.; MSS.	manuscript; manu- scripts	ornith.....	ornithology
Mt.....	Mount, mountain	Os.....	Osmium
mus.....	music	OS.	Old Saxon
MUS.DOC...	Doctor of Music	O. T., or	
myth.....	mythology, mytho- logical	O. Test...	Old Testament
N.....	Nitrogen	Oxf.....	Oxford
N. or n....	North, -ern, -ward	oz.....	ounce, ounces
n	noun	P.....	Phosphorus
n or neut...	neuter	p.; pp.....	page; pages
Na	Sodium [Natrium]	p., or part..	participle
Nah.....	Nahum	Pa. or Penn.	Pennsylvania
		paint	painting
		palæon....	palæontology
		parl	parliament
		pass.....	passive

ABBREVIATIONS.

pathol or
 path.....pathology
 Pb.....Lead [*Plumbum*]
 Pd.....Palladium
 Penn or Pa. Pennsylvania
 perf.....perfect
 perh.....perhaps
 Pers.....Persian, Persic
 pers.....person
 persp.....perspective
 pert.....pertaining [to]
 Pet.....Peter
 Pg. or Port. Portuguese
 phar.....pharmacy
 PH.D.....Doctor of Philoso-
 phy
 Phen.....Phenician
 Phil.....Philippians
 Philem.....Philemon
 philol.....philology, philologi-
 cal
 philos. { philosophy, philo-
 or phil... } sophical
 phonog.....phonography
 photog.....photography
 phren.....phrenology
 phys.....physics, physical
 physiol.....physiology, physiol-
 ological
 Pied.....Piedmontese
 Pl.....Plate
 pl. or plu...plural
 Pl. D.....Platt Deutsch
 plupf.....pluperfect
 P.M.....afternoon [*post meri-
 diem*]
 pneum.....pneumatics
 P. O.....Post-office
 poet.....poetical
 Pol.....Polish
 pol econ...political economy
 polit.....politics, political
 pop.....population
 Port. or Pg. Portuguese
 poss.....possessive
 pp.....pages
 pp.....past participle, per-
 fect participle
 p. pr.....present participle
 Pr. or Prov. Provencal
 pref.....prefix
 prep.....preposition
 Pres.....President
 pres.....present
 Presb.....Presbyterian
 pret.....preterit
 prim.....primitive
 priv.....privative
 prob.....probably, probable
 Prof.....Professor
 pron.....pronoun
 pron.....pronunciation, pro-
 nounced
 prop.....properly
 pros.....prosody
 Prot.....Protestant
 Prov. or Pr. Provencal
 Prov.....Proverbs
 prov.....province, provincial
 Prov. Eng.. Provincial English
 Prus.....Prussia, -n
 Ps.....Psalm, Psalms
 psychol... psychology

pt.....past tense
 pt.....pint
 Pt.....Platinum
 pub.....published, publisher,
 publication
 pwt.....penny weight
 Q.....Quebec
 qt.....quart
 qtr.....quarter [weight]
 qu.....query
 q.v.....which see [*quod
 vide*]
 R.....Rhodium
 R.....River
 Rb.....Rubidium
 R. Cath... Roman Catholic
 rec. sec.... recording secretary
 Ref.....Reformed
 refl.....reflex
 reg.....regular, -ly
 regt.....regiment
 rel. pro. or
 rel.....relative pronoun
 repr.....representing
 repub.....republican
 Rev.....Revelation
 Rev.....The Reverend
 Rev. V.....Revised Version
 rhet.....rhetoric, -al
 R. I.....Rhode Island
 R. N.....Royal Navy
 Rom.....Roman, Romans
 Rom.....Romanic or Ro-
 mance
 Rom Cath. { Roman Catholic
 Ch. or R. }
 C. Ch..... Church
 r.r.....railroad
 Rt. Rev... Right Reverend
 Ru.....Ruthenium
 Russ.....Russian
 r.w.....railway
 S.....Saxon
 S.....Sulphur
 s.....second, seconds
 s. [l. s. &]. shilling, shillings
 S. or s.....South, -ern, -ward
 S. A. or
 S. Amer.. South America, -n
 Sam.....Samaritan
 Sam.....Samuel
 Sans, or
 Skr.....Sanskrit
 Sb.....Antimony [*Stibium*]
 s.c.....understand, supply,
 namely [*scilicet*]
 S. C. or
 S. Car.... South Carolina
 Scand.....Scandinavian
 Scot.....Scotland, Scotch
 scr.....scruple, scruples
 Scrip.....Scripture [s], Scrip-
 tural
 sculp.....sculpture
 S. D.....South Dakota
 Se.....Selenium
 sec.....secretary
 sec.....section
 Sem.....Semitic
 Sep.....September
 Serv.....Servian
 Shaks.....Shakespeare
 Si.....Silicon

ABBREVIATIONS.

Sic.....Sicilian
 sing.....singular
 sis.....sister
 Skr. or
 Sans.....Sanskrit
 Slav.....Slavonic, Slavic
 Sn.....Tin [*Stannum*]
 Soc.....Society
 Song Sol...Song of Solomon
 Sp.....Spanish
 sp. gr.....specific gravity
 sq.....square
 Sr.....Senior
 Sr.....Strontium
 St.: Ste...Saint
 St.street
 stat.....statute
 s.t.d.....Doctor of Sacred
 Theology
 subj.....subjunctive
 suf.....suffix
 Su. Goth...Suo-Gothic
 superl.....superlative
 Supp.....Supplement
 SuptSuperintendent
 surg.....surgery, surgical
 Surv.....surveying
 Sw.....Swedish
 Swab.....Swabian
 sym.....symbol
 syn.....synonym, -y
 Syr.....Syriac, Syrian
 ttown
 Ta.....Tantalum
 Tart.....Tartar
 Te.....Tellurium
 technol ... technology
 teleg.....telegraphy
 Tenn.....Tennessee
 term.....termination
 terr.....territory
 Teut.....Teutonic
 Tex.....Texas
 Th.....Thorium
 theattheatrical
 theol.....theology, theological
 therap.....therapeutics
 Thess.....Thessalonians
 Ti.....Titanium
 Tim.....Timothy
 Tit.....Titus
 TlThallium
 toxicol....toxicology
 tp.....township
 tr. or trans.transitive
 transl.....translation, trans-
 lated

trigon.....trigonometry
 Turk.....Turkish
 typog.....typography, typographical
 U.....Uranium
 ult.....ultimate, -ly
 Unit.....Unitarian
 Univ.....Universalist
 Univ.....University
 U. Presb...United Presbyterian
 U. S.United States
 U. S. A....United States Army
 U. S. N....United States Navy
 Ut.....Utah
 V.....Vanadium
 v.....verb
 Va.....Virginia
 var.....variant [word]
 var.....variety of [species]
 Ven.....Venerable
 Venet.....Venetian
 vet.....veterinary
 v. i. or
 v. intr...verb intransitive
 vil.....village
 viz.....namely, to-wit [*vide licet*]
 v. n.....verb neuter
 voc.....vocative
 vol.....volume
 vols.....volunteers
 Vt.....Vermont
 v. tr.....verb transitive
 W.....Tungsten [*Wolfram*]
 W.....Welsh
 W. or w...West, -ern, -ward
 WalWalachian
 Wall.....Walloon
 Wash.....Washington
 Westph...Westphalia, -n
 W. Ind. ... } West Indies, West
 or W. I.. } Indian
 Wis.....Wisconsin
 wt.....weight
 W. Va.....West Virginia
 Wyo.....Wyoming
 Y.....Yttrium
 yd.....yard
 yr.....year
 Zech.....Zechariah
 Zeph.....Zephaniah
 Zn.....Zinc
 zool.....zoology, zoological
 Zr.....Zirconium

See also ABBREVIATIONS: in Vol. I.

IMPERIAL ENCYCLOPEDIA AND DICTIONARY

GOLD LACE: fabric formed by weaving silken threads previously gilded. The peculiarity of this manufacture consists in the gilding of the silk in such manner that it shall retain flexibility for weaving. A deep yellow or orange colored silk is used. The usual method is by what is called 'fibre-plating.' A rod of silver is gilded by simply pressing and burnishing leaves of gold upon it. This gilded silver is then drawn into very fine wire, so fine that one ounce of metal can be extended to the length of more than a mile. It is then flattened between polished steel rollers, and further extended so that a mile and a quarter weighs only one ounce; for the last drawing, the wire is passed through ruby dies. The film of gold upon this flattened wire is much thinner than beaten gold-leaf, and has frequently been quoted as an instance of the divisibility of matter, as one inch of the highly gilded wire contains but the eighty-millionth part of an ounce of gold, or $\frac{1}{80,000,000}$ of an inch, which is a visible quantity exhibiting the color and lustre of gold, contains but $\frac{1}{800,000,000}$ of an ounce, or one ounce of gold covers more than 100 m. of wire. This flattened gilded wire is then wound over the silk, so as to inclose it completely, and produce an apparently golden thread. Other means of directly gilding the thread have been tried, and for some purposes are successful, but none yet discovered give the thread the same degree of lustre as the above, which was first practiced in a ruder manner by the Hindus. Hock's method of fibre gilding is to pass the silk through a mucilaginous solution, and then receive it on a brass cylinder, over which it is closely rolled. Gold-leaf is then laid upon this coil of gummed silk, and thus one side is coated: the other side is gilded by rolling it from the first on to a second cylinder in the opposite direction, thus the plain side falls outermost, and is

GOLDMARK—GOLDONI.

then coated with gold-leaf as before. This is rather cheaper than the fibre plated silk, and more flexible, but not so brilliant.

GOLDMARK, KARL: an Austro-Hungarian composer; b. of Jewish parentage in Keszthely, Hungary, 1832, May 18; settled in Vienna, where he wrote many of his compositions. His best features are very skilful management of orchestral music and picturesque originality. He became popular in the United States through his operas *Merlin* and *The Queen of Sheba*, which were produced in 1887, for the first time on any stage, in the Metropolitan Opera House, New York city; and also by his overtures *Penthesilca* and *Sakuntala*. His symphony *The Country Wedding*, has proved a great success.

GOLD OF PLEASURE (*Camelina*): genus of plants of the nat. ord. *Cruciferae*, having an erect calyx, small bright yellow flowers, and inflated pear-shaped or wedge-shaped pouches. The species are few. The common Gold of Pleasure (*C. sativa*), (Fr. *Cameline*, Germ. *Dotter*) is an annual plant 1½–3 ft. high, with terminal racemes and pear-shaped pouches; the leaves smooth, bright green, entire or slightly toothed, the middle stem-leaves arrow-shaped and embracing the stem. Notwithstanding its high-sounding English name, the plant is of humble and plain appearance. It grows in fields and waste places in Europe and n. Asia. In many parts of Germany, Belgium, and s. Europe, it is extensively cultivated for the abundant oil in its seeds. The seeds and the oil-cake made from them are used also for feeding cattle, though inferior to linseed, and to the oil-cake obtained from linseed. The oil, though sweet and pure at first, is very liable to become rancid, and is less valued than that of rapeseed or colza: the seeds of Gold of Pleasure are often mixed with rape-seed for the production of oil. The value of the plant in agriculture depends much on its adaptation to poor sandy soils, though it prefers those of better quality; and on the briefness of its period of vegetation, adapting it for being sown after another crop has failed, or for being plowed down as a green manure.

GOLDONI, gol-dō'nē, CARLO: 1707–1793, Feb. 6; b. Venice: most celebrated writer of comedy among the Italians. He received his first education at Rome. His father intended him for an actor, and fitted up a private theatre for his diversion at home, but the boy showed no aptitude for histrionic performances, and was sent to Pavia to study for the priesthood. G., however, was still less fitted for an ecclesiastic than an actor, and was expelled from the college for writing scurrilous satires. In 1731, after his father's death, he was received as advocate; but finding the legal profession not lucrative, he relinquished it, and began composing comic almanacs, which became highly popular. Several of his minor comedies were represented about this time, and attracted much public favor by novelty as well as merit. In 1736 he married the daughter of a notary of Genoa, and subsequently went to Bologna, where, through an introduction to Prince Lob-

GOLDSBOROUGH—GOLDSCHMIDT.

kowitz, he was entrusted with the composition of an ode in honor of Maria Theresa, and with the organization of the theatrical entertainments of the Austrian army. Later, he was at Florence, working assiduously at comedies. On his return to Venice he made very lucrative arrangements with the manager of the theatre of St. Luke, and after a visit to Rome passed into France, and was appointed Italian master to the royal children, which situation allowed him to apply himself tranquilly to his literary occupations. In Paris he produced one of his most admired comedies, in French, entitled *Le Bourru bienfaisant* (The Benevolent Grumbler). It excited universal admiration, and drew forth a most eulogistic criticism from the pen of Voltaire. On the breaking out of the Revolution, G. lost his pension, and died shortly before its restoration by decree of the convention. G. has left 150 comedies of unequal merit. The larger part are inimitable representations of the events of daily life, under both their simplest and most complex aspects. G's compositions show as aim—the advancement of honorable sentiments, and the flagellation of prevailing vices and follies.

GOLDSBOROUGH, *gōlz'būr-réh*, **LOUIS MALESHERBES**, U.S.N.: 1805, Feb. 18—1877, Feb. 20; b. Washington, D. C. His father, Charles Washington G., was chief clerk in the navy dept 1798-1812, and procured a midshipman's appointment for him when only 7 years old, 1812, June 18, according to an old English custom long observed in the U. S. navy. He was commissioned lieut. 1825, promoted commander 1841, capt. 1855, rear-admiral 1861, and retired 1873. In 1827, with 40 men he recovered the English brig *Comet* from a force of 200 Greek pirates in the Doro Passage. In 1861, he was appointed commander-in-chief of the n. Atlantic blockading squadron, planned and executed the joint army and naval expedition to the Sounds of N. C., known as the Eurnside (q.v.) expedition, which captured Roanoke Island 1862, Feb. 5. He commanded the European squadron 1865, and the Mare Island navy yard, Cal., 1868, and at the time of his retirement had been longer in the service and seen more active duty than any other naval officer then living.

GOLDSCHMIDT, *gōlt'shmīt*, **HERMANN**: 1802, June 17—1866, Sep. 11; b. Frankfort, Germany: astronomer. He studied painting with Cornelius and Schuor in Munich, opened a studio in Paris 1836, and painted with success till 1847, when he turned his attention to astronomy. As a painter he produced the *Cumaan Sibyl* (1844), *Offering to Venus* (1845), *View of Rome* (1849), *Death of Romeo and Juliet* (1857), and a number of Alpine landscapes. As an astronomer he discovered 14 asteroids between Mars and Jupiter (1852-61), for which he received the grand astronomical prize of the Acad. of Sciences. He discovered also a large number of stars not previously indicated on atlases, and several new ones near Sirius,

GOLDSCHMIDT, JENNY LIND (Madame Otto G.): cele-

GOLDSINNY.

brated Swedish singer, 1821, Oct. 6—1887, Nov.; b. Stockholm. She was of humble parentage, and her musical gifts were noticed first by an actress, by whose influence she was admitted, at the age of nine, into the Conservatory of Stockholm, where she received lessons of Crœlius and Berg. She sang before the court with success, and at the age of 16 appeared in the rôle of Agatha, in *Der Freischütz*. Four years later, she went to Paris, to receive lessons from Garcia. Her voice was now thought wanting in volume, and when she appeared at the Grand Opera two years later, her failure was so mortifying that she is said to have resolved never again to sing in France. Returning to Stockholm, she was heard with enthusiasm in *Robert le Diable*, and at the instance of Meyerbeer was engaged at Berlin 1845. After singing two years in Prussia, she visited Vienna, and other German cities, and made her *debut* in London 1847, with very marked success. Her return to Stockholm was greeted with an ovation, and the tickets to the opera in which she appeared were sold at auction. She returned to London 1849, and won an immense triumph. The royal family and court were present at nearly every representation, and the receipts were often over £2,000. The London season was followed by a concert tour in the provinces, with a similar success, and her great popularity was increased by the distribution of a large part of her receipts in charities. In 1850, she made an engagement with Mr. P. T. Barnum of New York, for a concert tour in America, extending through the United States, British provinces, Mexico, and the W. Indies. The receipts of this well-managed tour were \$610,000, of which Mademoiselle Lind received \$302,000. While in America, she was married to Otto Goldschmidt, native of Hamburg, who accompanied her as pianist. They returned to Europe 1852, and resided at Dresden after she had visited Stockholm, and expended \$200,000 in endowing schools in her native country. After that time Madame G. rarely sang at concerts. In 1874, her husband and she taught music at Wiesbaden; in 1883, Madame G. consented to teach singing at the English Royal College of Music. Her voice was a soprano of 2½ octaves, remarkable for sweetness, purity, and sympathetic tone.

GOLD'SINNY, or **GOLD'FINNY** [from their prevalent yellow color]: certain small species of *Crenilabrus*, genus of fishes of the Wrasse family (*Labridæ*). They are plentiful on the coasts of n. Europe. They frequent rocky shores, and are sometimes taken by anglers from the rocks. Like the wrasses, they have a very elongated dorsal fin.

GOLDSMITH.

GOLDSMITH, *gôld'smith*, OLIVER: 1728, Nov. 10—1774, Apr. 4; b. in the village of Pallas, county of Longford, Ireland. His father, the Rev. Charles G., clergyman of the Established Church, held the living of Kilkenny West. At the age of six, G. was placed under the care of the village schoolmaster, when an attack of small-pox interrupted his studies. On his recovery, he attended school at various places. 1745, June 11, he entered Trinity College, Dublin, as a sizar; the expense of his education being defrayed by his uncle, the Rev. Thomas Contarine. At the university—where Burke was his contemporary—G. gave no evidence of the possession of talent; and becoming involved in some irregularity he quitted his studies in disgust. He lingered in Dublin till his funds were exhausted, then wandered on to Cork, where, he being in great distress, a handful of peas was given him by a girl at a wake, the flavor of which remained always sweet in his memory. By his brother Henry, he was brought back to college, where, 1749, Feb. 27, he received the degree of B.A. His uncle was now anxious that his nephew should enter the clerical profession; but when he appeared before the bishop, he was rejected. His kind-hearted relative then gave him £50, and sent him to Dublin to study law; but G., being attracted to a gaming-table, risked his entire capital, and of course lost it. Another sum was then raised, and he went to Edinburgh to study medicine, where he remained 18 months, but did not take a degree. He then went to the continent, hovered about Leyden for some time, haunting the gaming-tables with small success; and in 1755, Feb., he left that city to travel on foot through Europe, scantily provided as to purse and wardrobe, but rich in his kindly nature and his wonder-working flute.

After taking his degree of B.M. at Padua or Louvain, G. returned to England, 1756, Feb., when, by the assistance of Dr. Sleigh, a fellow-student, he set up as a physician among the poor. He did not succeed in his profession, and he is represented as having become usher in the academy of Dr. Milner at Peckham. During this period he supported himself by contributions to the *Monthly Review*. He became a candidate for a medical appointment at Coromandel, but was rejected by the College of Surgeons. The clothes in which he appeared for examination had been procured on the security of Mr. Griffiths, editor of the *Monthly Review*; and as G., urged by sharp distress, had pawned them, his publisher threatened him with the terrors of a jail. He had now reached the lowest depths of misery; but the dawn was about to break.

His first publication of note was an *Inquiry into the Present State of Polite Learning in Europe*, published 1759, Apr., a work of small value. 1760, Jan., Mr. Newbery commenced the *Public Ledger*, to which G. contributed the celebrated *Chinese Letters*, afterward republished under the title *The Citizen of the World*. He also wrote a *Life of Beau Nash*, and a superficial *History of England*, in a series of letters. 1761, May 31, he was introduced by Dr. Percy to



Order of the Golden Fleece.



Common Golden-rod: a
garden variety.



Goldfinch (*Carduelis elegans*).

GOLDSMITH.

Dr. Johnson, who, in turn, introduced his new friend to the Literary Club. In 1764, Dec., *The Traveller* appeared, and at once placed him in the front rank of English authors. Two years after this he published the *Vicar of Wakefield*, which has now charmed four generations. In rapid succession he produced his other works. The comedy of the *Good Natured Man*, 1767; *Roman History*, 1768; and *The Deserted Village*—sweetest of all his poems—1770. In 1773, his comedy of *She Stoops to Conquer* was produced at Covent Garden with great applause. His other works are —*Grecian History*, 1774; *Retaliation*, a poem, 1777; and *History of Animated Nature*, which he did not live to complete. Although now in receipt of large sums for his works, G. had not escaped from pecuniary embarrassment. He was extravagant, loved fine living and rich clothes, his charities were bounded only by his purse, and he haunted the gaming-table quite as frequently, and with as constant ill success, as of old. In 1774, March, he came up to London, ill in body and harassed in mind, and took to bed on the 25th. With characteristic wilfulness and imprudence, he, contrary to the advice of his medical advisers, persisted in the use of James's Powder. He became rapidly worse, and Dr. Turtton said: 'Your pulse is in greater disorder than it should be from the degree of fever you have. Is your mind at ease?' 'No, it is not,' was the poet's reply, and the last words he uttered. He died £2,000 in debt, and more sincerely lamented than any literary man of his time. Old and infirm people sobbed on the stairs of his apartments, Johnson and Burke grieved, and Reynolds, when he heard the news, laid down his pencil, and left his studio. He was buried in Temple Church, and a monument was erected to him in Westminster Abbey, bearing an epitaph by Dr. Johnson.

G. was the most natural genius of his time. He did not possess Johnson's mass of intellect, nor Burke's passion and general force, and he was without accurate knowledge; but he wrote the finest poem, the most exquisite novel, and—with the exception perhaps of the *School for Scandal*—the most delightful comedy of the period. Blundering, impulsive, vain, and extravagant, clumsy in manner and undignified in presence, he was laughed at and ridiculed by his contemporaries; but with pen in hand, and in the solitude of his chamber, he was a match for any of them, and took the finest and kindest revenges. Nothing could be more natural, simple, and graceful than his style, in which lay his strength. It is full of exquisite expressions, and most cunning turns. Whatever he said, he said in the most graceful way. When he wrote nonsense, he wrote it so exquisitely that it is better often than other people's sense. Johnson who, though he laughed at, yet loved and understood him, criticised him admirably in the remark: 'He is now writing a natural history, and will make it as agreeable as a Persian tale.' The standard life of G. is by Forster (1854); the excellent little work on G. by William Black appeared in 1879; lives have been written also by Prior (1836) and Washington Irving (1849).

GOLDSMITH'S COMPANY—GOLF.

GOLD'SMITHS' COM'PANY: English guild originally organized for the protection of workers in gold and silver, and afterward given charge of the official assaying and stamping of standard gold. The date of its origin is lost in antiquity. Claims have been made that it was founded in early Anglo-Saxon times, it was reported as operating without a license in 1180, its members quarrelled with an assoc. of merchant tailors 1236, and it was incorporated as a company 1396. The first stone of its present hall, near the gen. post-office, London, was laid 1407. It is probably the richest as well as the oldest guild in existence, receives large fees from manufacturers for assaying all gold and silver articles, and from the govt. for collecting excise dues, and maintains fifteen local charities at a very large annual expenditure. The G. C. hall-marks of assay are 5, indicating the reign, standard, price, makers, and date. The latter since 1438 has been shown by a letter of the alphabet, changed in letter every year and in style of letter every 20 years. The reign mark is the sovereign's head, the standard a lion passant. See **PLATE MARKS**.

GOLDYLOCKS, n. *gōl'dī-lōks* [*gold*, and *locks*]: a native plant, so called from the tufts of yellow flowers which terminate the stems; a familiar name of various species of plants, as *Helichrysum*, *Stachas*, *Ranunculus auric'omus*, and for the genus *Chrysōcōmā*.

GOLF, or **GOFF**, n. *gōlf*, or *gōff* [Gael. *colbh*; Ger. *kolbe*; Sw. *kolf*, a club; Icel. *kólf*, a bulb; *kylfa*, a club]: favorite outdoor pastime played over large links with clubs and a ball. **GOLF'ING**, n. the act of playing at the game of golf.—*Golf* was introduced into Scotland at a date not known, but it appears to have been practiced by all classes in the reign of King James I. Charles I. was much attached to the game, and on his visit to Scotland 1641, was engaged in it on Leith Links when intimation was given him of the rebellion in Ireland, whereupon he threw down his club, and returned in great agitation to Holyroodhouse. The Duke of York, afterward James II., also delighted in the game; and Prince Leopold, who frequently plays, was elected capt. of the St. Andrews Royal Club 1876.

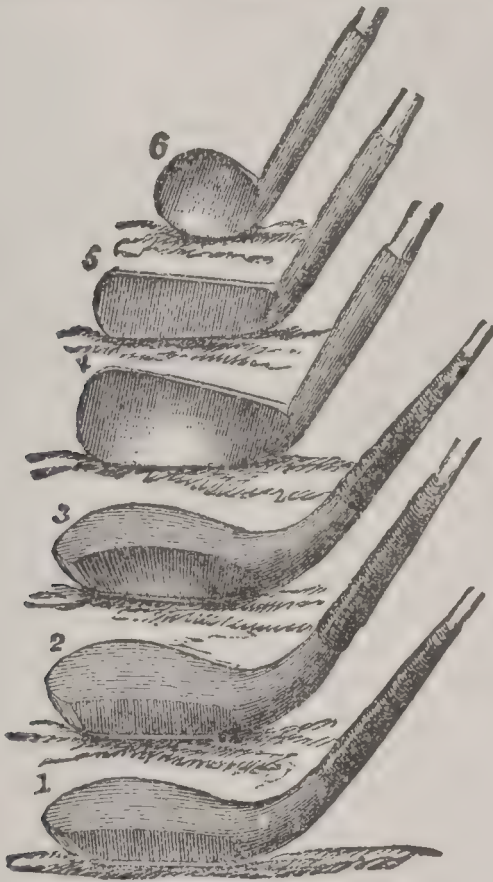
Until late years golf was confined to Scotland; but latterly it has been established s. of the Tweed, and in many of the British colonies, and at many places in the United States. It is played on what are called in Scotland *links* (Eng. *downs*), that is, tracts of sandy soil covered with short grass, frequent along the e. coast. Ground is preferable that is diversified by knolls, sand-pits, and other *hazards* (as they are termed in golfing phrasology), the avoiding of which is one of the most important points of the game.

A series of small round holes, about four inches in diameter, and several inches in depth, are cut in the turf, at distances of 100 to 400 or 500 yds., according to the nature of the ground, so as to form a circuit or *round*. The rival players are either two in number, which is the simplest arrangement, or four (two against two), in which case

GOLF.

the two partners strike the ball on their side alternately. The balls, weighing about two ounces, are made of gutta-percha, and painted white so as to be readily seen.

An ordinary golf-club consists of two parts spliced together—namely, the shaft and head: the shaft is usually made of hickory, or lance-wood; the handle covered with leather; the head (heavily weighted with lead behind, and faced with horn) of well-seasoned apple-tree or beech. Every player has a set of clubs, differing in length and shape to suit the distance to be driven, and the position of the ball; for (except in striking off from a hole, when the ball may be *teed*—i.e., placed advantageously on a little heap of sand called a *tee*) it is a rule that the ball must be struck as it happens to lie. Some positions of the ball re-



Club Heads:

1, play-club; 2, putter; 3, spoon; 4, sand-iron; 5, cleek; 6, niblick or track-iron.

quire a club with an iron head. The usual complement of clubs is six; but those who refine on the gradation of implements use as many as ten, technically distinguished as the *play-club*, *long-spoon*, *mid-spoon*, *short-spoon*, *baffing-spoon*, *driving-putter*, *putter*, *sand-iron*, *cleek*, and *niblick* or *track-iron*—the last three have iron heads, the others are of wood. Every player is usually provided with an attendant, called a *caddy*, who carries his clubs and ‘tees’ his balls.

The object of the game is, starting from the first hole, to drive the ball into the next hole with as few strokes as possible; and so on round the course. The player (or pair of players) whose ball is holed in the fewest strokes has gained that hole; and the *match* is usually decided by the greatest

GOLFO DULCE—GOLGOTHA.

number of holes gained in one or more rounds; sometimes it is made to depend on the aggregate number of strokes taken to 'hole' one or more rounds. To play the game well requires long practice, and very few attain great excellence who have not played from their youth. But any one may in a year or two learn to play tolerably, so as to take pleasure in the game; and for all who have followed it to this extent it has a fascination. It has the advantage of being suited for both old and young. The strong and energetic find scope for their energy in driving long balls (crack-players will drive a ball above 200 yards); but the more important points of the game—an exact eye, a steady and measured stroke for the short distances, and skill in avoiding hazards—are called forth in all cases. With the muscular exercise required by the actual play, there is a mixture of walking which particularly suits those whose pursuits are sedentary—walking, too, on a breezy field, and under circumstances which make it far more beneficial than an ordinary 'constitutional.' The rules of the St. Andrews Royal and Ancient Union Club are those that govern nearly all the other associations; see *Chambers's Information for the People*, No. 94; see also *Golf, a Royal and Ancient Game*, by R. M. Clark (Edin. 1876).

GOLFO DULCE, *gōlfō dōl'sā* or *-thā* [Spanish, *Sweet or Fresh Gulf*]: body of water on the coast, in the state of Guatemala, Central America, measuring 26 m. by 11, and having an average depth of 6 or 8 fathoms. It communicates with the outer sea, here known as the Gulf of Honduras, by a narrow strait called the Rio Dulce.

GOLGOTHA, n. *gōlgōth-ā* [Heb. a skull]: the place where our Lord was crucified—so named probably because it was a hillock or mound, bald and skull-like, or with a skull-shaped rock protruding. The Latin equivalent is *Calvaria*, 'a bare skull.' This place, was outside the gates of Jerusalem, e. of the city, though the common opinion, a tradition from the middle ages, fixes it in the n.w. (see CALVARY). It was probably the ordinary spot of execution, though this is to be inferred rather from the fact that, in the eyes of the Roman officers of justice, Christ was simply a common criminal, than from any supposed connection between the word 'skull' and a place of execution. A church was built over the spot in the 4th c. by Constantine. What is *now* called the 'Church of the Holy Sepulchre' to the northwest of Jerusalem, but within the walls of the city, has manifestly no claim whatever to be considered the building erected by Constantine; but while recent biblical scholars and travellers generally have assumed that the scene of our Savior's crucifixion and sepulture is not ascertainable, a writer in Smith's *Dictionary of the Bible* offers strong reasons for believing that the present mosque of Omar, called by the Mohammedans 'The Dome of the Rock,' occupies the site of the sacred Golgotha. One difficulty in tracing the spot, is in the fact that sieges, conflagrations, and re-buildings have greatly changed the ancient line of the city-wall

GOLIARD—GOLITZIN.

GOLIARD, n. *gō'li-árd*: in *chh. hist.*, one of the authors of the poems bearing the name of Goliath (see below), hence generally a writer of satirical poetry; a satirist. **GOLIARDERY**, n. *gō'li-árd-er-ī*, name given to the series of satirical Latin poems directed against the abuses of the Rom. Cath. Church in the 13th c. **GOLIATH**, n. *gō'li-as*, name under which certain satirical poems on ecclesiastical subjects were given to the world in the 13th century.

GOLIATH: see **GATH**.

GOLIATH BEETLE (*Goliathus*): genus of tropical coleopterous insects, of the section *Pentamera*, and re-



Goliath Beetle (*Goliathus magnus*).

markable for the large size of some, particularly the African species. They are of splendid colors. Little is known of their habits.

GOLITZIN, or *go-lit'zēn* (or **GOLYZIN**, or **GALITZIN**, or **GALYZIN**, or **GALLITZIN**, *gá-lēt'sēn*): one of the most numerous, powerful, and distinguished Russian families. It derives its origin from the Lithuanian prince Gedimin, founder of the Jagellonian dynasty of rulers in Poland, Hungary, and Bohemia. Among the leading members of the family are—1. The princes **MICHAEL** and **DIMITRI G.**, Russian commanders under Wassili IV., grand-duke of Warsaw, who were taken prisoners by the Poles at the battle of Orscha 1514. Dimitri died in captivity, and Michail was released only after a confinement of 38 years.—2. **WASSILI G.**, surnamed the Great, b. 1633, councilor and favorite of Sophia, sister of Peter the Great and regent during his minority. Wassili was a man of liberal culture and civilized tastes. His great aim was to bring Russia into contact with the west of Europe, and to encourage the arts and sciences. His design to marry Sophia, and plant himself on the Russian throne, however, miscarried: Sophia was placed by her brother in a convent, and Wassili was banished to a spot on the Frozen Ocean, where he died of poison.—3. **BORIS G.**, cousin of Wassili G., was Peter the Great's tutor, and one of the administrators of the kingdom during the czar's first journey abroad.—4.

GOLITZIN.

DIMITRI G., also cousin of Wassili was a distinguished Russian statesman; ambassador at the Turkish court; afterward director of the imperial finances; and finally head of the reform party of G. and Dolgoruki, which wished to limit the absolute authority of the czar. Dimitri's plan failed; the two families were banished, and Dimitri himself ended his days in the dungeons of Schüsselburg.—5. **MICHAEL G.**, b. about 1675, brother of Dimitri, and one of the most distinguished Russian generals. He was the inseparable companion of Peter the Great in all his campaigns. His most famous achievement was the conquest of Finland. He died at Moscow, 1730.—6. **DIMITRI G.**, b. 1738, went as Russian ambassador to France 1763, and to Holland 1773. He died 1803. He wrote one or two books, but he owes the preservation of his name mainly to his wife, the celebrated **AMALIE**, Princess G., daughter of the Prussian general, Count von Schmettau. This lady (b. at Berlin, 1748, Aug. 28) was remarkable for her literary culture, grace and amiability of disposition and sympathetic relations with scholars and poets, but, above all, by her ardent pietism, which found its most congenial sphere in the mystic and venerable sanctities of Rom. Catholicism. Having separated from her husband, she took up her residence in Münster, where she gathered round her a circle of learned companions. Here resided for a longer or shorter time Von Fürstenberg, Goethe, Jacobi, and others, but her most attached friends were Hemsterhuis and Hamann. She is the *Diotima* to whom the former of these, under the name of Dioklas, addressed his *Lettre sur l'Athéisme* (1785). She largely contributed to the conversion of Count Stolberg and his family to Rom. Catholicism, and called forth that excess of religious feeling which for a considerable period characterized many circles of German society, and which Voss so sharply reprobated in his *Wie ward Fritz Stolberg ein Unfreier* (How Fritz Stolberg became a Slave). The Princess Amalie died 1806, Aug. 24.—Compare *Denkwürdigkeiten aus dem Leben der Fürstin Amalie von G.* (Münster 1828).—7. **DIMITRI AUGUSTINE G.**, son of Princess Amalie, b. at the Hague, 1770, Dec. 22. He became a Rom. Catholic in his 17th year, shortly after his mother; and through the influence exercised over him by a clerical tutor during a voyage to America, he resolved to devote himself to the priesthood. In 1795, Dimitri Augustine was ordained a priest in the United States by Bp. Carroll of Baltimore, and betook himself to a bleak region among the Alleghany Mountains, in Pennsylvania, where he was known as 'Father Smith.' Here he laid the foundation of a town, called Loretto, where he died 1840, May. A monument was erected to his memory in a neighboring village, 1848. He was austere in his mode of life, but liberal in the highest degree to others, and an affectionate and indefatigable pastor. He wrote various controversial works, some of which are still largely read in the United States; e.g., *Defense of Catholic Principles*, *Letter to a Protestant Friend*, and *Appeal to the Protestant Public*.—8. Prince **EMANUEL G.**, b. Paris, 1804,

GOLLNOW—GOMARISTS.

studied in that city, and afterward entered the Russian army. He translated into French Wrangel's book on northern Siberia, and wrote an interesting work, entitled *La Finlande: Notes recueillies en 1848* (2 vols. Paris 1852). He died at Paris 1853, February.

GOLLNOW, *göl'növ*: small manufacturing town of Prussia, province of Pomerania, on the right bank of the Ihna, 15 m. n.e. of Stettin. It was formerly a Hanse-town, and came into the possession of Prussia 1720. It has two suburbs. The manufactures are woolen cloth, ribbons, paper, and tobacco; there are also copper-works. Pop. about 9,000.

GÖLNITZ, or **GOLLNITZ**, *göl'nits*: small town in n. Hungary, county of Zips, on the left bank of the river G., a feeder of the Hernad, 17 m. s.w. of Eperies. It has important iron and copper mines, and manufactures of wire and cutlery. Pop. 6,000.

GOLOMYN'KA (*Comephorus Baikalensis*): remarkable fish, found only in Lake Baikal, the only known species of its genus, which belongs to the goby family. It is about 12 inches long, is destitute of scales, and is very soft, its whole substance abounding in oil, which is obtained from it by pressure. It is never eaten.

GOLORE: see **GAIORE**.

GOLOSH, n. *gö-lösh'* [F. *galoche*, a *golosh*, a *clog*—from mid. L. *cālōpēdiā*, a wooden shoe]: a shoe worn over another to keep the foot dry. The French applied the term *galoche* at first to shoes partly of leather, partly of wood, the soles being wood, and the uppers leather. The term was introduced into England as a cordwainer's technicality, to signify a method of repairing old boots and shoes by putting a narrow strip of leather above the sole so as to surround the lower part of the upper leather. It was adopted also by the patten and clog makers to distinguish what were also called French clogs from ordinary clogs and pattens. Clogs were mere soles of wood with straps across the instep to keep them on; pattens were the same, with iron rings to raise them from the ground; but the galoshes were wooden soles, usually with a joint at the part where the tread of the foot came, and with upper leathers like very low shoes. By the term galoshes is now generally meant what are known in the United States as India-rubber over-shoes (see **OVER-SHOES**). **GOLOSH'ES**, n. plu. *-ēz*. **GOLOSHED'**, a. *-lösh't'*, applied to half-boots in which the parts passing round the ankles are of a different material from the rest of the upper—generally of a finer quality of leather, with elastic gussets at sides, or made to lace or button: also **GALOCHE**, or **GALOSHE**.

GOLPE, *gölp*, in Heraldry: a roundel purpure; sometimes called a *wound*: see **ROUNDEL**.

GOMARISTS, *gō'mar-ists*, or **CONTRA-REMONSTRANTS**, *kōn'tra rē-mōn'strants*: opponents of the doctrines of Arminius (q.v.), founder of the Dutch Remonstrants. The party was named from its leader, Francis Gomar, theolo-

GOMBROON—GOMPHOSIS.

gian; 1563, Jan. 30—1641, Jan. 11; b. Burges. In 1594 he was appointed prof. of divinity at Leyden, and signalized himself by his vehement antipathy to the views of his colleague, Arminius, and at the synod of Dort, 1618, he was mainly instrumental in securing the expulsion of the Arminians from the Reformed Church.

GOMBROON, *gòm-brôn'*, called also BENDER- or BUNDER-ABBASI: town and seaport of Persia, at the mouth of the Persian Gulf, in the Strait of Ormuz, opposite the island of Ormuz. Bender-Abbasi owed its name and importance to Shah Abbás, who, assisted by the English, drove the Portuguese 1622 from Ormuz, or Hormuz, then a flourishing commercial town on the island of the same name, ruined the seaport, and transferred its commerce to Gombroon. For some time G. prospered abundantly, French, Dutch, and English factories were erected here, and the population rose to about 30,000. A dispute among the natives, however, resulted in the destruction of the European factories and houses, and only the ruins of these remain.

GOMER, n. *gō'mēr* [Heb. a mound, a heap]: same as HOMER—a measure (q.v.).

GOMERA, *gō-mā'rā*: one of the Canary Islands (q.v.).

GOMERIL, n. *gōm'ēr il* or GOMRAL, n. *gōm'rāl* [Scot.]: a stupid fellow: ADJ. foolish; nonsensical.

GOMEZ, *gō'mes*, ESTEVAN: d. 1525, Oct.; b. Portugal: explorer. He was pilot of Magellan's ship *San Antonio* on the voyage of discovery 1519. When the fleet reached Magellan's Strait, he was sent in the *San Antonio* to explore a channel further s., and on the way headed a mutiny, placed the capt. in irons, and returned to Spain, 1521, Mar. In 1524 he started on a search for a n. w. passage to the Moluccas, reached New York Bay, sailed some distance up the Hudson river, and then along the n. e. coast and up the Penobscot.

GOMEZ, MAXIMO: a Cuban military officer; b. in San Domingo, 1838; served in the Spanish army, which he accompanied to Cuba when the freedom of San Domingo was declared. Subsequently he was angered by the abuse of some Cuban refugees by Gen. Villas, and after assaulting that officer withdrew from the Spanish army. In 1868 he joined the Cuban revolt known as the Ten Years' War; was promoted maj.-gen., and later made commander-in-chief. When the war of 1895-98 broke out he again took up arms against Spain and gallantly fought till Cuba was occupied by American troops. On 1899, Feb. 25, after marching through Havana at the head of 2,500 Cuban soldiers, he was tendered a reception in that city by the U. S. military authorities.

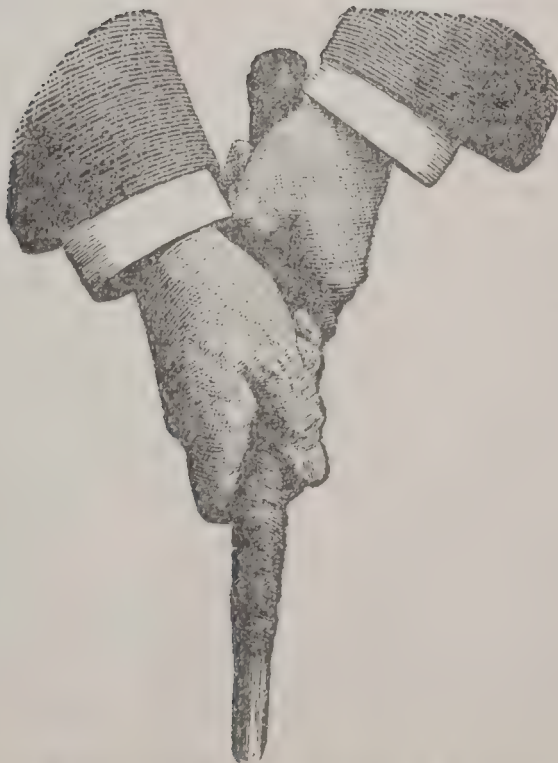
GOMOR'RAH: see SODOM AND GOMORRAH.

GOMPHIASIS, n. *gōm-fī-ā'sis* [Gr. *gomphiasis*, toothache]: in *path*, looseness of the teeth in their sockets.

GOMPHOSIS, n. *gōm-fī'sis* [Gr. *gomphos*, a nail]: in *anat.*, a form of joint in which a conical body is fastened into a socket, as the teeth in the jaw. GOM'PHOLITE, n.



Golf.—The Swing in Driving.



Golf.—Method of Holding the Club in Driving.

GOMPHRENA—GONCOURT.

ſō-lit [Gr. *lithos*, a stone]: in *geol.*, a name applied to certain sandy conglomerates which occur in vast thickness at the foot of the Alps in the great Swiss valley.

GOMPHRENA, n. *gõm-frě'nâ* [changed from L. *gromphæna*, a kind of amaranth, probably *Amaranthus tricolor*]: typical genus of *Gomphreneæ*, a tribe of *Amaranthaceæ*.

GOMUTO, *gõ-mô'tō*, or **ARENG**, *â'rěng*, or **ARENGA**, or **EJOO PALM**, *ě'jō pām* (*Arenga saccharifera*, *Saguerus Rumphii*, or *Borassus gomutus*): an important palm which grows in Cochin China and in the interior of Java, Sumatra, Celebes, and Amboyna, on dry ground. The stem is 20–30 ft. high; the leaves 15–25 ft. long, pinnated. The flowers are in bunches 6–10 ft. long; the fruit is a yellowish brown, three-seeded berry, of the size of a small apple, and extremely acrid. The stem, when young, is entirely covered with sheaths of fallen leaves, and black horsehair-like fibres, which issue in great abundance from their margins; but as the tree increases in age, these drop off, leaving an elegant naked columnar stem. The strongest of the fibres, resembling porcupine quills in thickness, are used by the Malays as styles for writing on the leaves of other palms. But the finer fibres are by far the most valuable; they are well-known in eastern commerce as Gomuto or Gomuti or Ejoo fibre, and are much used for making strong cordage; particularly for the cables and standing-rigging of ships, European as well as native. Want of pliancy renders them less fit for running-rigging, and for many other purposes. They need no preparation but spinning or twisting. No ropes of vegetable fibre are so imperishable, when often wet, as those G. fibre. At the base of the leaves of the G. palm there is a fine woolly material, called *bara*, much employed in caulking ships and stuffing cushions. The saccharine sap, obtained in great abundance by cutting the spadices of the flowers, is a delicious beverage, and by fermentation yields an intoxicating wine (*neroo*), from which a spirituous liquor called *brum* is made. In Java, a brown sugar, much used by the natives, is made by boiling the sap.

GONAIVES, *go-nîv'*: seaport of Hayti, with an excellent harbor; on the bay of G., which deeply indents the w. coast of the island. It is 65 m. n.w. of *Port Republicain*, formerly *Port au Prince*, the capital.

GONAKIE, n. *gõn-â'kě* [an African word]: in *bot.*, *Acacia Adansonii*. It yields good timber.

GONANGIUM, n. *gõ-năn'jě-ũm* [Gr. *gonos*, offspring, *angeion*, a vessel]: the chitinous receptacle in which the reproductive buds of certain of the hydrozoa are produced.

GONCOURT. *gõng-kér'*, EDMOND LOUIS ANTOINE HUOT DE: 1822, May 26—1896, July 16; b. Nancy: prolific French writer; also, his brother, JULES ALFRED HUOT DE (1830–70). The two produced a long list of miscellaneous works. Beginning with *En 18—*, a novel (1851), the two brothers published about 30 works in their joint names; including *Les Mystères des Théâtres* (1853); *Histoire de la Société*

GONDA—GONDOKORA.

Française pendant la Révolution (1854-5); *Histoire de Marie Antoinette* (1858); *Les Maitresses de Louis XV.* (1860), etc. Edmond afterward issued in his own name *L'Œuvre de Watteau*, a classified catalogue (1876); *L'Œuvre de Proudhon* (1877); and two novels, *La Fille Elisa* (1878), and *Les Frères Zemganno* (1879). As novelists, the brothers, whose style has the defect of wearisome detail, represent the so-called 'naturalist' school. See ZOLA.

GONDA, *gõn'da*: dist. of Oudh, India; bounded n. by the Himalayas, e. by the Basti dist., s. by Fyzabad and Bara Banki, w. by Bhabraich; lat. $26^{\circ} 40'$ — $27^{\circ} 50'$ n., long. $81^{\circ} 35'$ — $82^{\circ} 48'$ e.; 2,824 sq. m. The surface, a rich alluvial deposit, is divided into swampy, upland, and lowland belts, drained chiefly by the Gogra and Rápti rivers, and irrigated by means of numerous small lakes. Several species of wild animals and large game birds abound. In 1869 there were 5 towns, with a pop. exceeding 5,000 each, Gonda, Balrámpur, Colonelganj, Nawabganj, and Utraula. The dist. exported rice and food grains, and imported cotton, salt, and European piece-goods. Pop. about 1,300,000, of which 1,049,397 are Hindus, 117,070 Mohammedans, and 48 Christians: males 602,862, females 563,653.

GONDA is the chief town of G. dist., lat. $27^{\circ} 8'$ n., long. $82^{\circ} 1'$ e.; formerly noted for manufactures of shields but now of slight importance. It contains a civil station, dispensary, school and literary institute, court-house, and jail. Pop. 13,722.

GONDAR, *gõn'dâr*: city of Abyssinia, former cap. of the kingdom of G. or Amhara; lat. $12^{\circ} 36'$ n., and long. $37^{\circ} 29'$ e.; on an insulated hill 7,420 ft. above sea-level, and 30 m. from the n. shore of Lake Dembea or Izana (see ABYSSINIA). G. is the seat of the archbishop of Abyssinia, and was formerly the residence of the emperor or *Negus*. At one time it had 50 to 100 churches and about 50,000 inhabitants; pop. at present about 7,000; but the latest returns show 44 churches, with nearly 1,200 priests, besides numerous monks and nuns. It is poorly and irregularly built, and resembles a forest as much as a city, on account of the number of trees surrounding the houses. The palace, a square stone structure flanked with towers, is the most important building. There are no shops or bazaars, all articles for sale being exposed on mats in the market-place. G. has manufactures of fire-arms, sword-blades, knives, scissors, razors, shields, pottery, etc.; and considerable transit-trade between Massuah on the Red Sea and the s. of Abyssinia, in slaves, musk, wax, ivory, coffee, honey, etc. The mean temperature of G., as observed by Rüppell during the seven months Oct. to Apr. inclusive, was 69° , and the lowest temperature during that time, 53.09° . A great quantity of rain falls here. Part of the town was burned by the dervishes 1889.

GONDOKORO, *gõn-dõ-kõ'rõ*: town in the country of the Bari negroes, on the Upper Nile, in $4^{\circ} 54'$ n.— $31^{\circ} 28'$ e. It is a centre of the ivory trade, and before its annexation to Egypt, with the surrounding territories, by Baker 1871,

GONDOLA—GONDWANA.

was a centre also of the slave trade. The military station then established here was called Ismailia; but before the abandonment by Egypt of the equatorial provinces, G. had been superseded as capital by Lado, n.w. of G. A Rom. Cath. mission was discontinued 1858 owing to the bad climate.

GONDOLA, n. *gõn'dô-lâ* [It. *gondola*]: Venetian pleasure-boat or barge. **GONDOLIER**, n. *-ler'*, a man who rows a gondola.—The *Gondola* is a long narrow boat (averaging 30 ft. by 4) used chiefly on the canals of Venice. The prow and stern taper to a point, and curve out of the water to a height



Venetian Gondola.

of at least 5 ft. In the centre there is a curtained chamber for the occupants: the boat is propelled by means of oars or poles by one, two, or occasionally four men. The rowers stand as they row, and wear the livery of the family to which the gondola belongs.—The term *gondola* is also applied to passage-boats having 6 or 8 oars, used in other parts of Italy.

GONDWANA, *gõnd-wâ'na*: land of the Gonds; hilly tract of Hindustan, between 19° 50' and 24° 30' n lat., and in e. long. between 77° 38' and 87° 20'. It occupies a somewhat central position, sending its drainage at once n. into the Jumna, e. through the Mahanadi into the Bay of Bengal, and w. through the Tapti and the Nerbudda into the Arabian Sea—the water-shed in some places attaining an elevation of 5,000 ft. So isolated a locality, itself unfavorable to civilization, is rendered still more so by the extreme barbarism of the inhabitants, who are regarded, with some appearance of probability, as the genuine aborigines of India and as perhaps allied to the Davidians who dwell s. of them. They are of low stature, seldom exceeding 5 ft.; and are without written language, and pantheistic in religion. Wives are bought, and the women perform the manual labor while the men apply themselves to the chase. Their total number in central India is about 1,500,000. It is certain that the country has never really formed a part of any of the great empires in the east.

GONE—GONIASTER.

GONE, *gõn*: pp. of *Go*, which see.

GONEPTERYX, n. *gõn-ëp ter-iks* [Gr. *gõniã*, a corner, an angle, or *gonu*, the knee; *pteryx*, a wing]: genus of butterflies, family *Papilionide*, sub-family *Pieridi*. *G. rhamnii* is the brimstone butterfly. Its wings have an angular projection and are brimstone-colored.

GONFALON, n. *gõn'fâl òn*, or **GONFANON**, n. *gõn'fa-nõn* [It. *gonfalone*; OF. *gonfanon*—from mid. H.Ger. *gunt* or *gund*, battle]: in *OE.*, an ensign; a standard; in virtue of bearing which, the chief magistrates in many Italian cities were known as Gonfaloniers.

GONG, n. *gõng* [Chinese or Malay; probably imitative of the sound]: Chinese and Indian musical instrument of percussion of a circular shape, like the lid of a pot or caldion, and beaten with a stick like a drum; a metal drum. It is made of a mixture of metals (78 to 80 parts of copper, and 22 to 20 parts of tin), and shaped into a basin-like form, flat and large, with a rim a few inches deep. The sound of the *G.* is produced by striking it while hung by the rim, with a wooden mallet, which puts the metal into an extraordinary state of vibration, and produces a loud, sometimes deep, sometimes piercing sound.—The term is applied sometimes also to signal-bells, door-bells, etc., struck by a hammer.

GONGORA, *gõn'go-rá*, **LUIS Y ARGOTE**: Spanish poet: 1561 July 11--1627, May 24; b. Cordova. He studied law at the Univ. of Salamanca, where he composed the greater part of his erotic poems, romances, and satires. At the age of 45 he took priest's orders, and obtained a small prebend in the cathedral of Cordova; was afterward appointed chaplain to Philip III., and died in his native city. *G.*'s poetic career divides itself into two periods. In his *first* or youthful period, he yielded to the natural tendencies of his genius, and to the spirit of the nation. His lyrics and romances of this period are in the old genuine Spanish style; and in caustic satire and burlesque wit, are admirable specimens of their class. *G.*, however, had the ambition to outdo all predecessors, and to furnish something wholly new: and he introduced a new poetic phraseology, called the *estilo culto*, or 'cultivated style.' To popularize the *estilo culto*, he wrote *Polifemo*, *Soledades*, and the *Fables of Pyramus and Thisbe*, which mark his *second* period—productions pedantic and tasteless, poor in invention, but rich in pompous phrases, absurd imagery, and obscure mythological allusions. In this way he became the founder of a new school, the *Gongoristas* or *Cultoristas*, who, lacking their master's undeniable genius, surpassed him in the depravity of their literary tastes. *G.* has been called the 'Andalusian Pindar.' See Churton's excellent work, *G., an Historical and Critical Essay, with Translations* (1862).

GONGYLUS, n. *gõn'jíl-ús* [Gr. *gonggýlos*, round]: in *bot.*, applied to round hard bodies produced on certain *algæ*, which become ultimately detached, and germinate. **GON'GYLI**, n. plu. *jíl-î*.

GONIASTER, n. *gõ'nî-ús'tér* [Gr. *gõniã*, an angle; *aster*,

GONIATITES—GONIOPHOLIS.

a star]: a genus of star-fishes, popularly known as *cushion-stars*. GONIATITES, n. -i-tis [Gr. *gōniā*]: in *geol.*, a genus of the ammonite family, so called from the zigzag lines which mark the junctions of their chambers.

GONIATITES, *gō-nī-a-tī'tēz*: genus of fossil cephalopodous mollusca, belonging to the same family as the ammonites. The genus is characterized by the structure of the septa, which are lobed, but without lateral denticulations, as in ammonites; they consequently exhibit, in a section, a continuous undulating line. Some forms with slightly waved septa approach very near to the nautilus, from which, however, they are separated by the position of the small and delicate siphuncle, which is on the dorsal or external side of the shell. The lines of growth on the external surface have a sigmoid direction. The siphonal portion is shorter than the sides, forming a sinus at the back, as in the nautilus. The last chamber, the one tenanted by the animal, occupies a whole whorl, and has besides a considerable lateral expansion. The shells are small, seldom exceeding six inches in diameter. This genus is confined to the Palæozoic strata: upward of 150 species have been described from the Devonian, Carboniferous, and Triassic measures.

GONIDIA, n. *gō-nīd-ī ā* [Gr. *gonos*, offspring, seed; *sidōs*, appearance]: in *bot.*, green germinating cells in some cryptogamous plants, apparently serving the purpose of reproduction, but now considered as the algæ on which the remaining part of the lichen is parasitic. It is not, however, certain that the bodies called G. in different classes of cryptogamous plants are all of exactly the same nature. The G. of Lichens (q.v.) are found in layers in the interior of the thallus. In some of the lowest vegetable organisms, as *Desmidiaceæ*, the G. are formed by the *endochrome* or contents of the cell breaking up into granules, sometimes invested with cilia, and moving as zoospores, at first within the cavity of the cell in which they are formed, and afterward without it.

GONIOMETER, n. *gōn'ī ōm'ē-tēr* [Gr. *gōniā*, an angle; *metron*, a measure]: instrument for measuring solid angles, particularly angles of crystals. The simplest is that invented by Carangeau, which consists of two brass rulers turning on a common centre, between which the crystal is so placed that its faces coincide with the edges of the rulers, and the angle is measured on a graduated arc. For large crystals this is sufficiently accurate, but, as many minerals are found crystallized only in small crystals, and as small crystals of any mineral are generally the most perfect, an instrument more exact was invented by Wollaston and improved by Naumann. This reflecting goniometer measures very small crystals with certainty to within a single minute (1'), by the reflection of the rays of light from the surface of the different faces of the crystal. GO'NIOM'ETRY, n. -trī, the art of. GO'NIOMET'RICAL, a. -ō-mēt-ri-kāul, pertaining to.

GONIOPHOLIS, n. *gō-nī-ŏf'o-līs* [Gr. *gōnia*, corner, angle; *pholis*, horny scale of a reptile]: in *paleon.*, genus of fossil crocodiles, placed by Sir Richard Owen under his

GONOBlastidia—GONORRHEA.

sub-order *Amphicælia*, and by Prof. Huxley doubtfully under that which he terms *Mesosuchia*. The remains on which the genus was founded were found, 1835, in a quarry near Swanage. The species is *G. crassidens*, sometimes called the *Swanage crocodile*.

GONOBlastidia, n. plu. *gõn'õ-bläs-tíd'î-ä* [Gr. *gonos*, offspring; *blastidiõn*, a dim. of *blastos*, a bud]: the processes which carry the reproductive receptacles or 'gonophores' in many of the hydrozoa.

GONOCALYX, n. *gõn'õ-kal'iks* [Gr. *gõnos*, offspring; *kalux*, a cup]: the swimming-bell in a medusiform gonophore; the same structure in a gonophore which is not detached.

GONOPHORE, n. *gõn'õ-fõr* [Gr. *gõnos*, generation, *phorẽõ*, I bear]: in bot., an elevated or elongated receptacle, bearing the stamens and carpels in a prominent and conspicuous manner; the generative buds or receptacles of the reproductive elements in the hydrozoa.

GONORRHEA, n. *gõn'õr-rẽ'ä* [Gr. *gõnẽ*, semen; *rhẽõ*, I flow]: most frequent form of venereal disease. **GON'ORRHE'AL**, a. *-rẽ'äl*, of or pertaining to.—*Gonorrhœa* was a term originally applied almost indiscriminately to all discharges from the genital passages in both sexes, but especially in the male. In the course of usage, the term has become restricted almost entirely to one particular kind of discharge, which, from its connection with a contagious poison, was originally called, in strict nosological language, *G. virulenta*. This form of the disease is, in the great majority of cases, caused by the direct communication of sound persons with those already affected; accordingly *G.* is one of the numerous penalties attending an indiscriminate and impure intercourse of the sexes: see **SYPHILIS**. It sometimes, however, results from merely constitutional causes, as in scrofulous, gouty, or rheumatic subjects. *G.* is a very acute and painful form of disease; it is liable to leave its traces in the more chronic form of gleet, which may last for a considerable time, and may give alarm from being taken for other disorders. The name *G.* was formed on the erroneous supposition that the discharge consists of the spermatic fluid, whereas, the disease being an inflammation of the mucous membrane of some part of the generative organs, the discharge is the muco-purulent or purulent discharge from the diseased surface. Hence the name *Blennorrhagia* has been proposed for the ailment. The disease may reach its height in a period of from one to three weeks; it then usually subsides, and the various symptoms abate in severity. For gonorrhœal ophthalmia, see **OPHTHALMIA**. Victims of *G.* and the allied disorders should beware of consulting any but medical men of high standing and undoubted character. Advertisements, often an offense to decency, by an unworthy class of practitioners, who often extort vast sums of money by threat of exposure, should act as warnings of avoidance rather than as attractions. It has been quaintly remarked: 'The only prophylactic to be relied on is

GONOSOME—GONZAGA.

chastity; next to this, scap and water, followed by an alum-wash.'

GONOSOME, n. *gõn'õ-sõm* [Gr. *gõnos*, offspring; *sõma*, body]: one of the reproductive zooids of a hydrozoon.

GONOTHECA, n. *gõn'õ thẽ'kã* [Gr. *gõnos*, offspring; *thẽkẽ*, a chest, a case]: the chitinous receptacle within which the gonophores of certain of the hydrozoa are produced.

GONSAL'VO, or GONZAL'VO: see GONZALO.

GONVILLE AND CAIUS COLLEGE, CAMBRIDGE: originally founded 1348 by Edmund Gonville, son of Sir Nicholas Gonville, rector of Terrington, in Norfolk, and endowed for a master and three fellows. In 1353, William Bateman, Bp. of Norwich, whom Gonville had appointed his executor, removed the college to its present site, and altered the name to the 'Hall of the Annunciation of Blessed Mary the Virgin.' In 1558, Dr. Caius obtained a royal charter, founding the college for the third time, and altering the name to that which it now bears. By statute, the college consists of a master, 30 fellows, and 36 scholars; but two fellowships have been added—one in 1865, another in 1870. There are also five college studentships in medicine, founded by Christopher Taucered, each of the annual value of £100.

GONZAGA, *gon-zã'gã* (or GONZUGUE), HOUSE OF: old princely family of Italy; of German origin, tracing its descent from Emperor Lothaire. It came into notice first in the 11th c., and from it sprang a long line of sovereign Dukes of Mantua and Montferrat. The sway of this race over Mantua continued more than three centuries, and many of its members were magnificent promoters and cultivators of arts, science, and literature. Wielding originally in the state the vast civic influence which in so many instances were exercised by families of weight in the history of Italy, the Gonzagas gradually monopolized all the chief posts of command, both civil and military; and finally, 1432, were invested with the title and jurisdiction of hereditary marquises, and 1530 with that of dukes or sovereigns of the state. After their elevation to ducal dignity, they continued to own the feudal supremacy of the empire, and were the faithful champions of the imperial interests in their policy with other states. The house of G., and that of the Visconti Dukes of Milan, were perpetually at war.—The most illustrious personages of this house were the following:

GIOVANNI FRANCESCO (1407–44), in whose favor Mantua was created a marquisate by the Emperor Sigismund, in return for his services to the empire.—GIAN FRANCESCO (1484–1519) defeated Charles VIII. of France at the battle of Fornovo, on the banks of the Taro, 1495, when G. left 3,500 troops on the field, and Charles was forced to a hasty retreat. G. also took part in the engagement of Atella, 1496, which led to the capitulation of the French forces.—FREDERICK II. (1519–40), son of Gian Francesco, in recognition of his services to the imperial forces in their contest

GONZALO DI CORDOVA.

with France, was invested by Emperor Charles V. with the ducal dignity 1530, and obtained the marquisate of Montferriat 1536. During the reign of this prince, the court of Mantua was one of the most magnificent and gay of Europe.—GUGLIELMO (1550–87), son of Frederick II., was humpbacked, but a wise and enlightened ruler; his secretary was Bernardo Tasso, father of the poet—VINCENZO (1587–1612), son of Guglielmo, was the warm friend and patron of Tasso, and succeeded in obtaining the poet's freedom, when he was confined as insane by Duke Alfonso d'Este. Vincenzo was much esteemed for piety, justice, and liberality. He was successively followed by his three sons, FRANCESCO, FERDINANDO, and VINCENTIO, who died without heirs, and thus the direct line of the ducal branch became extinct.

A collateral branch, in the person of Charles I., Duke of Nevers, son of Ludovico, the brother of Guglielmo, the humpbacked, claimed the duchy, which was contested by his cousin Cæsar, Duke of Guastalla. This family feud led to a general war, in which France supported Nevers, and the empire claimed the right of adjudging Mantua, as an imperial fief, to a candidate of imperial election. Mantua, in 1629, was stormed, sacked, and stripped of all its magnificent possessions, by the imperialists, and never regained its former splendor. Charles de Nevers submitted finally to the emperor, and was installed in the duchy. The artistic treasures collected for ages by the G. princes were scattered throughout Europe, and came into the possession of several of the reigning sovereigns. The successors of Charles were dissipated and silly, and the tenth and last Duke of Mantua, Ferdinand-Charles, was the most contemptible and dissolute of all. As he had countenanced the French in the war of the succession, the Emperor Joseph I. deprived him of his states, placing him under the ban of the empire. He died in exile 1708, leaving no issue.

GONZALO DI CORDOVA, *gon-thá' lô dē kav'r'do-vá* (GONZALO, or GONSALVO, HERNANDEZ Y AGUILAR): celebrated Spanish warrior: 1453, Mar. 16–1515, Dec. 2; b. Montillo, near Cordova. He served with great distinction first in the war with the Moors of Granada, afterward in the Portuguese campaign. At the close of the final contest with Granada, he concluded the negotiation with Boabdil (Abu Abdallah), king of the Moors, in such a masterly manner, that the rulers of Spain bestowed on him a pension and a large estate in the conquered territory. He was next sent to the assistance of Ferdinand, king of Naples, against the French. In less than a year, G., with his limited resources, had conquered the greater part of the kingdom, and obtained the appellation of 'El Gran Capitano.' In conjunction with King Ferdinand, he succeeded in completely expelling the French from Italy; and 1498, Aug., returned to Spain, having received for his services an estate in the Abruzzi with the title of the Duke of San Angelo. When the partition of the kingdom of Naples was determined on by a compact at Granada, 1500,

GOOD.

Nov. 11, G. again set out for Italy; with a body of 4,300 men, and on the way took Zante and Cephalonia from the Turks, and restored them to the Venetians. He then landed in Sicily, occupied Naples and Calabria, and demanded from the French that, in compliance with the compact, they should yield up Capitanata and Basilicata. This demand being rejected, a war broke out, which was waged with varied success. After the victory of Cerignola, 1503, Apr., G. took possession of Calabria, Abruzzo, Apulia, even the city of Naples itself, and then laid siege to Gaëta, but was forced to retreat before a superior force of the enemy. Dec. 29 of the same year, he fell upon them unexpectedly near the Carigliano, and obtained a complete victory. The French army was almost annihilated; the fortress of Gaëta fell, and the possession of Naples was secured to the Spaniards. King Ferdinand bestowed the duchy of Sesia upon the conqueror, and appointed him viceroy of Naples, with unlimited authority. His good fortune, however, made him many powerful enemies, and G. was recalled to Spain, where the king treated him with marked neglect. G. then betook himself to his estates in Granada; but after the defeat of the new viceroy in Naples by Gaston de Foix he was again appointed to the command of the Spanish-Italian army. Mental suffering, however, had undermined the old hero's health, and he died at Granada.

GOOD, a. *gûd* [AS. *gôd*; Dut. *goed*; Icel. *gódr*; Ger. *gut*; Gr. *agâthos*, good]: the opposite of *bad*; pious; sound; undamaged; proper or fit; considerable; having sufficient; pleasant to the taste; unblemished; kind; favorable; convenient; clever; beneficial; comely—as she is *good-looking*; real—as he is in *good* earnest; in the sense of wishing well—as, *good-day*, and *good-by*: N. the contrary of evil; virtue; righteousness; benefit; advantage: AD. well, as in the phrase *as good*: INT. a word expressing approbation or admiration. **GOODS**, n. plu. *gûdz*, household furniture; wares; merchandise. **GOOD'LY**, a. *-lî* [AS. *gôdlic*]: being of a handsome form; fine. **GOOD'LIHEAD**, n. *-lî-hêd*, in *OE.*, grace; goodness. **GOOD'LIEST**, a. most good or excellent. **GOOD'LINESS**, n. beauty of form; grace. **GOOD'NESS**, n. kindness; benevolence; Christian excellence; mercy. **GOODY**, n. *gûd i*, a familiar contr. for goodwife; a child's name for a sweetmeat. **AS GOOD AS**, the same as; no worse than; in effect; virtually. **A GOOD MANY**, a considerable number. **IN GOOD TIME**, early enough. **GOOD-BREEDING**, polite manners. **GOODMAN**, **GOODWIFE**, applied to the master and mistress of a house, implying some degree of respect. **GOOD WOMAN**, a familiar, but not quite respectful, term of address. **GOOD MANNERS**, politeness. **GOOD SENSE**, sound judgment. **GOODWILL**, kind feeling; favor; the benefit of a business in full operation, for which a price may be paid. **GOOD FELLOW**, a kind man; a boon companion. **GOOD FELLOWSHIP**, merry society; pleasant company. **GOOD-HUMOR**, a cheerful temper or state of mind. **GOOD-HUMORED**, a. being of a cheerful temper. **GOOD-HUMOREDLY**, ad. **GOOD-NATURE**, mildness and kindness

GOOD—GOODALE.

of disposition. **GOOD-NATURED**, a. possessing a mild disposition. **GOOD-NATUREDLY**, ad. **GOOD-TEMPERED**, having a temper not easily irritated. **GOOD HEED**, due caution; great care. **TO MAKE GOOD**, to supply deficiency; to prove or establish; to fulfil; to indemnify for. **TO STAND GOOD**, to be firm or valid. **AS GOOD AS HIS WORD**, performing what was promised. **FOR GOOD AND ALL**, completely; wholly. **GOOD BY**, or **GOOD-BYE**, -bī [a probable contraction of *God be with you*]: a salutation at leave-taking. **GOOD-SPEED**, an old form of wishing success—another form of *God speed you*. **GOODS AND CHATTELS**, in *law*, personal and movable things as distinguished from lands and tenements.—**SYN.** of 'good, a.': serviceable; useful; admirable; excellent; commendable; virtuous; religious; benevolent; humane; merciful; propitious; gracious; friendly; suited; suitable; adapted; skillful; handy; dexterous; sufficient; competent; adequate; valid; serious; actual; full; complete; honorable; fair;—of 'good, n.': prosperity; possession; property;—of 'goods': chattels; commodity; merchandise; freight; effects; wares; property; possession.

GOOD, *gūd*, **JOHN MASON**: 1764, May 25—1827, Jan. 2; b. Epping, in Essex: physician and author. He commenced practice as a surgeon, Sudbury, 1784, but meeting little success, he removed to London, 1793, principally for literary employment. In addition to *The Book of Nature*, by which chiefly he is known, and which appeared shortly before his death, he published various poems, translations, and professional treatises. Among his translations, were *Song of Songs, or Sacred Idylls*, trans from the Hebrew, 1803; translation of Lucretius, in verse, 1805 of the Book of Job, 1812; of the Book of Proverbs, 1821: and of the Book of Psalms. His *Study of Medicine*, 4 vols., was pub. 1822; a learned not trustworthy work. In conjunction with Olinthus Gregory and Bosworth, he published the *Pantologia or Encyclopædia, comprising a General Dictionary of Arts, Sciences, and General Literature*, 11 vols., completed, 1813. He died in London. Dr. Olinthus Gregory, published a memoir of his life, 1828.

GOODALE, *gūd'āl*, **DORA READ**: author: b. Mt. Washington, Mass., 1866, Oct. 29. She was brought up on her father's farm, learned to read at an early age and began composing verses as soon as she could write. In 1871 her sister Elaine, established a monthly paper entitled *Sky Farm Life*, to which both sisters contributed verses and other compositions regularly. The sisters have published jointly *Apple Blossoms; Verses of two Children*, with portraits (New York, 1878); *In Berkshire with the Wild Flowers* (1879); and *Verses from Sky Farm* (1880).

GOOD'ALE, **ELAINE**: author: b. Mount Washington, Mass., 1863, Oct. 9. She was brought up in like manner with her sister Dora Read G., was equally precocious in composing verses, and was appointed a teacher in the Hampton Normal and Agricultural Institute, Va., 1883. She there became interested in the education of Indian children, and two years afterward made a long visit to the Sioux

GOODALL—GOODE.

reservation. In 1886 she was appointed a govt. teacher at the Lower Brule agency, White River Camp, Dak. She has been editor of the Indian Dept. of the *Southern Workman* since 1883, contributed articles to New York and Boston newspapers. In 1891 she married Dr. Charles A. Eastman, a full-blood Sioux Indian.

GOODALL, *gûd'al*, FREDERICK: eminent English artist: b. London, 1822, Sep. 17; son of Edward Goodall, engraver. His first oil-picture was entitled, *Finding the Dead Body of a Miner by Torchlight*, for which the Soc. of Arts awarded him the large silver medal. During the summers 1838-42, he visited Normandy and Brittany, and 1839, when but 17 years of age, he exhibited his first picture at the Royal Acad., *French Soldiers Playing Cards in a Cabaret*. His *Entering Church*, as well as *The Return from a Christening*, which received a prize of £50 from the British Institution, were among his early pictures. *The Tired Soldier*, exhibited 1842, is in the Vernon Gallery. Some of his French scenes are *Veteran of the Old Guard Describing His Battles*, *La Fête du Mariage*, *The Wounded Soldier Returned to his Family*, *The Conscript*. In 1844 he went for subjects to Ireland, and later to N. Wales. Among his Irish scenes are, *Irish Courtship*, *The Irish Piper*, and the *Departure of the Emigrant Ship*. *The Village Festival*, is one of the best of his English subjects, exhibited 1847. His *Hunt the Slipper* (1849), *Raising the Maypole* (1851), *Arrest of a Peasant Loyalist—Brittany, 1793* (1855), *Cranmer at the Traitor's Gate* (1856), *Rising of the Nile*, *Subsiding of the Nile*, *An Intruder on the Bedouin's Pasture* (1876), etc., have added greatly to his reputation. He visited Egypt 1858. In 1852, G. was elected an associate of the Royal Acad., and 1863 a royal academician.

GOOD BEHAVIOR, in Law: phrase rather popular than legal; usually synonymous with keeping the peace. Thus, if one person assaults another, or threatens or provokes him to a breach of the peace, the offense is punishable summarily by justices of the peace, who, besides inflicting a fine, may, and often do bind over the offending party to keep the peace, and be of good behavior for a period of six or twelve months. The offending party is required to give a bond for a specified sum; and if the recognizance is forfeited, then the party may be again held for punishment.

GOODE, GEORGE BROWN: an American naturalist; 1851, Feb. 13—1896, Sept. 6; b. in New Albany, Ind.; was graduated at Wesleyan University, 1879. He was placed on the scientific staff of the United States National Museum in 1873, and four years later was appointed assistant secretary of the Smithsonian Institution. He was the author of *Principles of Museum Administration*; *Catalogue of the Collection to Illustrate the Animal Resources of the United States*; *The Fisheries and Fishing Industry of the United States*; *American Fishes*; *A Popular Treatise Upon the Game and Food Fishes of North America*; *The Nature and Economic History of the American Menhaden*; etc.

GOODELL—GOOD FRIDAY.

GOODELL', WILLIAM: 1799–1879; abolitionist. He was educated in Providence, R. I., studied theol. and was licensed to preach but never ordained, and was early identified with the temperance and anti-slavery movements. Removing to New York he was engaged as editor of the *Emancipator*, organ of the State Anti-slavery Soc., and afterward of the Utica organ, *The Friend of Man*. On his return to New York he founded and edited the *The Radical Abolitionist* and *The Principia*, in both of which he undertook to demonstrate that there was neither legal nor constitutional right for the existence of slavery, and that all courts of jurisdiction were fully empowered by statutes to regard and treat it as a crime. He wrote and spoke with great vigor in advocacy of his views, and published a work of wide research, *The History of Slavery and Anti-Slavery* (1851). During his career as a temperance advocate he edited *The Genius of Temperance* and other similar periodicals. He died in Janesville, Wis.

GOODELL, gûd-ĕl', WILLIAM, D.D.: 1792, Feb. 14—1867, Feb. 18; b. Templeton, Mass.: missionary. He graduated at Dartmouth College 1817, and Andover Theol. Seminary 1820, studied medicine, spent a year as agent of the A. B. C. F. M., and sailed for Malta 1822. After studying the Turkish and Armenian languages a year, he went to Beirut, where he engaged in missionary labor 5 years. On the withdrawal of consular protection 1828 he accompanied the other Syrian missionaries to Malta, where he remained till 1831, when he was ordered to undertake a mission among the Armenians in Constantinople. He labored there with distinguished success till 1865, when age and debility arising from climatic causes, led him to return to the United States. While his missionary labors were productive of inestimable good, his great life-work was the translation of the whole Bible from the original Greek and Hebrew into Armeno-Turkish. He completed the New Test. 1830, Jan. 8, the Old 1841, Nov. 6, and revised both 1863. He received the degree D.D. from Hamilton College 1854, and at the time of his death in Philadelphia was publishing a serial in the New York *Observer*, entitled *Reminiscences of the Missionary's Early Life*.

GOODENIACEÆ, gûd-ĕ-nĭ-ă'sĕ-ĕ: natural order oxogenous plants, of which about 150 species are known, mostly herbaceous, though a few are shrubs, and mostly natives of Australia and the islands of the Southern Ocean, a few being found in India, s. Africa, and S. America. The order is allied to *Campanulaceæ*, and *Lobeliaceæ*, but is destitute of their milky juice. The corolla is monopetalous, more or less irregular. A remarkable character of this order is that the summit of the style bears a little cup, in the bottom of which the stigma is placed. The flowers of some of the species are of considerable beauty. The young leaves of *Scaevola taccada* are used as a salad by the Malays; and the pith furnishes a kind of *rice-paper*, which they make into artificial flowers and other ornaments.

GOOD FRIDAY: Friday before Easter, observed in

GOOD HOPE—GOODRICH.

commemoration of the crucifixion of the Lord Jesus Christ. This day was kept as a day of mourning and of special prayer from a very early period. It was one of the two paschal days celebrated by the Christian Church, and in memory of the crucifixion, was called by the Greeks *Pascha Staurosimon*, or the 'Pasch of the Cross.' That it was observed as a day of rigid fast and of solemn and melancholy ceremonial, we learn from the 'Apostolic Constitutions' (b. v. c. 18), and from Eusebius (*Eccl. Hist.* ii. c. 17), who records also that, when Christianity was established in the empire, Constantine forbade the holding of law-courts, markets, and other public proceedings upon this day. In the Rom. Cath. Church, the service is peculiar; instead of the ordinary mass, it consists of what is called the Mass of the Presanctified, the sacred host being consecrated not on Good Friday, but reserved from the preceding day. The priests and attendants are robed in black, in token of mourning; the altar is stripped of its ornaments; the kiss of peace is omitted, in detestation of the kiss of the traitor Judas; the priest recites a long series of prayers for all classes, orders, and ranks in the church, and even for heretics, schismatics, pagans, and Jews. But the most striking part of the ceremonial is the so-called 'adoration of the cross,' or, in the old English popular vocabulary, 'creeping to the cross.' A large crucifix is placed upon the altar with appropriate ceremonies, in memory of the awful event which the crucifix represents, and the entire congregation, commencing with the celebrant priest and his ministers, approach, and upon their knees reverently kiss the figure of our crucified Lord. In the eyes of the Protestants, this ceremony appears to partake more strongly of the idolatrous character than any other in the Roman ritual; but Roman Catholics earnestly repudiate all such construction of it: see IDOLATRY: IMAGES. The very impressive office of 'Tenebræ' is held on G. F., as well as on the preceding two days: it consists of the matins and lauds of the office of Holy Saturday (the next day), and has this peculiarity, that at the close all the lights in the church are extinguished except one, which for a time (as a symbol of our Lord's death and burial) is hidden under the altar.

GOOD HOPE: see CAPE OF GOOD HOPE.

GOODRICH, CASPAR FREDERICK: an American naval officer; b. 1847, Jan. 7; was appointed to the navy from Connecticut, 1861, Dec. 9; graduated at the U. S. Naval Academy at the head of his class, 1864; promoted master, 1866, Dec. 1; lieut. 1868, March 12; lieut.-commander, 1869, March 26; commander, 1884, Sept. 7; and captain, 1897. He was naval attache on the staff of Lieut.-Gen. Sir Garnet Wolseley during the Tel-el-Kebir campaign, 1882. In 1885 he served on the Endicott Fortifications Board, and in 1886-89 had charge of the Torpedo Station. He commanded the *Jamestown*, *Constellation*, and *Concord* in 1891-95. During the war with Spain he was in command of the auxiliary cruiser *St. Louis* and the protected cruiser *Newark*.

GOODRICH, *gûd'rîj*, CHAUNCEY ALLEN, D.D.: 1790,

GOODRICH—GOODSIR.

Oct. 23—1860, Feb. 25; b. New Haven: lexicographer. He graduated at Yale College 1810, was tutor there 1812-14, studied theology, and was ordained pastor of the Congl. Church in Middletown 1816. After a year's service he resigned, was elected pres. of Williams College but declined 1820, was prof. of rhetoric in Yale College 1817-29, and of pastoral theology in Yale Divinity School from 1839 till his death. In 1814 he published a *Greek Grammar*, 1832 *Latin and Greek Lessons*, 1852 *Select British Eloquence*, 1829 established the *Christian Quarterly Spectator*, and edited it till 1839, and from 1828 till his death was engaged in abridging, supplementing, and revising the dictionary published by Noah Webster, his father-in-law.

GOOD'RICH, SAMUEL GRISWOLD (*Peter Parley*): 1793, Aug. 19—1860, May 9; b. Ridgefield, Conn.: author. After a year in foreign travel, he established himself in the publishing business in Hartford 1824, and Boston 1828. He edited *The Token*, an annual of exclusively American illustrations, poems, stories, and essays, 1828-42, and *Merry's Museum and Parley's Magazine* 1841-54, was a member of the Mass. senate 1838-9 and U. S. consul at Paris 1851-55, and while living abroad published in French *Les Etats Unis, aperçu statistique, historique, géographique, industriel, et social* (1852). Of nearly 200 separate vols. which he compiled, edited, and wrote, 170 were issued under the pen-name 'Peter Parley,' which were of a juvenile and educational character, and were translated into several foreign languages.

GOODSELL, DANIEL AYRES: an American clergyman; b. in Newbury, N. Y., 1840, Nov. 5; was graduated at the University of the City of New York. 1859; became a minister of the Meth. Epis. Church, 1859; was editor of the *Christian Advocate*, New York, 1880-88. In the latter year he was elected bishop.

GOODS IN COMMUN'ION: term borrowed by the law of Scotland from the customs of France, and applied to the joint personal property of a married couple, not subject to any deed, but left to the operation of the common law. See **HUSBAND AND WIFE**.

GOODSIR, gûd'sër, JOHN: 1814, Mar. 20—1867, Mar. 6; b. Anstruther, Fifeshire, Scotland: prof. of anat. in the Univ. of Edinburgh, 1846-67. He went through the literary course at St. Andrews Univ.; was apprenticed to a dentist in Edinburgh, and attended the medical classes there. In 1839 he published a striking essay on the teeth. For a time he assisted his father in practice, but in 1840 became conservator of the museum of the Royal College of Surgeons in Edinburgh; and 1842-3, delivered courses of lectures on the diseases of bone and cartilage. He also investigated the minute structure of the healthy tissues, and was one of the first observers who strongly insisted on the general diffusion, throughout the animal textures, of the minute bodies called *nuclei*. His memoirs on secreting structures and on the human placenta were very important. Many of his physiological and pathological essays were published in a volume 1845. He published many

GOOD TEMPLARS—GOOD-WILL.

valuable papers on comparative anatomy and natural history. In 1844, he was appointed assistant to Dr. Monro, prof. of anatomy in the Univ. of Edinburgh, and 1846 became his successor. His reputation as an anatomical teacher became very great and widely extended, and was maintained till ill-health overtook him near the close of his life. His views on the nucleated *cell* as the great agent in absorption, nutrition, and secretion, are now accepted as data in physiology. See *Memoir* by Prof. Turner (1868).

GOOD TEM'PLARS, INDEPENDENT ORDER OF: secret society whose members are required to subscribe to the following pledge: that they will not buy, sell, use, furnish, nor caused to be furnished to others, as a beverage, any spirituous or malt liquors, wine, or cider, and will discountenance the manufacture and sale thereof in all proper ways. The organization is divided into subordinate, grand (state), and supreme lodges; has a juvenile dept.; and is in operation in the United States, Canada, S. America, Africa, Australasia, the British Isles, Scandinavia, and Germany. The supreme lodge was organized in Syracuse, N. Y., 1852, with Nathaniel Curtis as the first R.W.G.T., and was reorganized at Cleveland, O., under the title of the Right Worthy Grand Lodge of the World, I. O. G. T. 1855, with James M. Moore as R.W.G.T. The Juvenile Dept. was organized at Baltimore under the name of the Cold Water Templars 1871, and the name was changed to Juvenile Templars 1874. At close of year, 1887, Apr. 30, there were of the G. T. 79 grand lodges in the world working under regular charters, 6,861 subordinate lodges, and 284,870 members, and 66 lodges with 2,342 members directly subordinate to the R. W. G. L. of the World; total 79 grand lodges, 6,927 subordinates, 287,212 members. In 1901 there were 100 grand lodges, and 360,068 members. The juvenile branch numbered 172,538.

GOOD-WILL', in Law: popular expression rather than a legal term. It means that kind of interest which is sold together with any profession, trade, or business. In reality it is not the business that is sold, for that is not a distinct thing recognized by the law, but the house, shop, fixtures, etc., are sold, and the trade debts; and with transferring these, the seller binds himself, either by covenant or by agreement, to do everything properly in his power to recommend his successor, and promote his interests in such business. If the seller acts contrary to such agreement, he is liable to an action. But the more usual course is for the seller to enter into an express covenant not to carry on the same business within 30, 40, or 100 m. or some specified moderate distance from the place where the purchaser carries it on. At first, such a covenant was sought to be set aside as invalid, on the ground that it tended to restrain the natural liberty of trade; but the courts have firmly established the validity of such a bargain, on the ground that if a definite radius of moderate length is fixed, it does not sensibly restrain trade, inasmuch as the person covenanting can go beyond those limits, and trade as much as he

GOODWIN—GOODWIN SANDS.

pleases. If the party break his covenant, he is liable to action for damages.

GOODWIN, THOMAS, D.D., 1600, Oct. 5—1679, Feb. 23; b. Rollesby, Norfolk, England: Independent minister. He received the degree B.A. at Christ's College, Cambridge 1616, was chosen a fellow of St. Catharine's Hall 1620, was licensed a univ. preacher 1625, and was appointed by the king as vicar of Trinity Church 1632. Two years afterward he resigned all his offices and left the univ. because of interferences by his ecclesiastical superior, and after spending some time in London became pastor of a congregation of English refugees at Arnheim, Holland, 1639. When the long parliament impeached Abp. Laud, G. returned to London and took charge of an independent congregation, attaining notable eminence as a preacher. In 1643 he was selected a member of the Westminster assembly and there allied himself with the Congl. party or 'Dissenting Brethren.' He was a man of great learning, and was frequently appointed to preach before the house of commons, by whose order his chief sermons were printed, and by whom he was appointed pres. of Magdalen College, Oxford, which office he held till the restoration of Charles. He became an intimate advisor of Oliver Cromwell, and from 1660 till his death applied himself to theological study and the care of a small congregation in London.

GOODWIN SANDS: famous banks of shifting sands, stretching more than 10 m. n.e. and s.w. at an average of $5\frac{1}{2}$ m off the e. coast of Kent, England. The sands are divided into two portions by a narrow channel, and at low water, many parts are uncovered. When the tide recedes, the sand becomes firm and safe; but after the ebb ceases the water permeates through the mass, rendering the whole pulpy and treacherous, in which condition it shifts to such a degree as to render charts uncertain from year to year. The northern portion is of triangular form— $3\frac{1}{2}$ m. long, $2\frac{1}{2}$ in greatest width; on the northernmost extremity, known as North Sand Head, a light-vessel (revolving light) abt. seven m. from Ramsgate, marks the entrance on this perilous shoal. In the centre; on the w. side, jutting out toward the shore, is the Bunt Head, a peculiarly dangerous portion, also marked by a light-ship (revolving light). The southern portion is 10 m. in length, $2\frac{1}{2}$ in width at its n. end, sloping toward the s.w., to a point called South Sand Head, also marked by a light-vessel (fixed light). A fourth (revolving, green) was added 1874, on the e. side, making four lights; nine buoys also surround the Sands.

From the sunken positions of these sands, they have always been dangerous to vessels passing through the Straits of Dover. On the other hand, they serve as a breakwater to form a secure anchorage in the Downs (q.v.) during easterly or south-easterly winds. The Downs, though safe under these circumstances, become dangerous when the wind blows strongly off-shore, at which time ships are liable to drag their anchors, and to strand upon the perfidious Goodwins, where their wrecks are soon en-

GOODYEAR.

tirely swallowed up. Many celebrated wrecks have taken place here, the most terrible having been the loss of an entire fleet of 13 men-of-war, in 1703 on the night of Nov. 26, on the Sands and neighboring shores. In two of these, the *Mary* and the *Restoration*, every soul perished, and 1,200 officers and men were lost altogether. 1805, Dec., here foundered the *Aurora*, a transport, when 500 perished; 1814, Dec., the *British Queen*, Ostend packet, was lost with all hands; and 1857, Jan., the mail-steamer *Violet* was destroyed. The greatest dangers are in the winter months.

These dangerous sands are said to have once been a low fertile island called Lomea (*Infera Insula* of the Romans), belonging to Earl Godwin, where he lived and kept his fleets; but in 1014, and again 1099, it was overwhelmed by a sudden inundation of the sea, which did great damage also in other parts of Europe. At the period of the Conquest by William of Normandy, these estates were taken from Earl Godwin's son, and bestowed on the abbey of St. Augustine at Canterbury. The abbot having diverted the funds with which the island should have been maintained against the sea, to the building of Tenterden steeple, allowed the sea-wall to become dilapidated; and in 1099, the waves rushed in, and overwhelmed the whole. Thus, 'Tenterden steeple was the cause of the Goodwin Sands'; so, at least, says one of the many legends connected with these remarkable shoals.

As a precaution, now, in foggy weather, bells or fog-horns in the light-ships are frequently sounded. Difficulty is experienced in finding firm anchorage for these vessels; and all efforts to establish a light-house have been unsuccessful. In 1840, a beacon was erected by Admiral Bullock, which stood for many years, and another 1847 on piles of iron screwed into the sand, but this was washed away two months afterward. As soon as a vessel is known to have been driven on the sands, signal rockets are thrown up and guns fired from the light-vessels, when one or other of the four life boats from Ramsgate, Deal, Walmer, or Kingsdown, immediately launch to the rescue, followed usually by 'hovellers' boats. These 'hovellers,' as the boatmen of East Kent are called, though in fine weather they appear to lead an inactive life, show, in tempest and danger, a praiseworthy intrepidity.

GOODYEAR, CHARLES: 1800, Dec. 29—1860, July 1; b. New Haven, Conn: American inventor. At the age of 21 he went into business in Philadelphia. Having failed as an iron manufacturer 1830 he began to experiment on the uses of india-rubber; and he expended all his means, and reduced his family to destitution, in experiments with various mixtures and processes, the most successful of which were with magnesia, lime, and nitric acid, to make it available for water-proof shoes, clothing, etc. His efforts were a series of failures; excepting a partial success in treating the surface of rubber goods with nitric acid, until he bought of one Hayward, a rival experimenter, an invention for mixing india-rubber with sulphur. The great secret of vulcanization, in which the two substances, sub-

jected to a high temperature, are converted into the elastic, enduring, and heat and cold-defying fabrics now in use, was an accidental discovery, made while standing by a stove, and idly subjecting a mixture of rubber and sulphur to its heat. This new product he patiently perfected, discovering new uses to which it could be applied, until it required 60 patents to secure his inventions. Some of these rights were secured by other persons in England, and in France they were forfeited by an informant; for this reason and because of expensive law-suits, he failed to receive much pecuniary profit from his discovery.

GOOKIN, *gák'in*, DANIEL: 1612-1687, Mar. 19; b: Kent, England: soldier. He accompanied his father's family to Va. 1621; successfully defended the family plantation during the Indian massacre 1622; removed to Cambridge, Mass; affiliated with the Puritans, and became a militia cap. 1644; was elected member of the Mass. house of deputies, speaker 1651, and magistrate 1652; and from 1656 till his death was supt. of all Indians owing allegiance to Mass. He co-operated with John Eliot in protecting and educating the Indians, visited Oliver Cromwell by invitation 1656-7, returned in the ship with the regicides whom he aided in concealing 1660, was appointed maj.gen. of the Mass. colony 1681, and was author of *Historical Collections of the Indians of Massachusetts* (pub. by the Mass. Hist. Soc. 1792), and a *History of New England* (lost).

GOOLARIE, *gól-lá'rē*, or GOMUL PASS, *go-mūl pás*: important pass in the n.w. of India, across the Sulieman range, from the Derajat into Cabul. It enters the mountains at their base, lat 32 6 n., long 70 e. It is very winding and rough, and infested with freebooters. It and the Kurran pass are the best known of the middle routes from Hindustan to Afghanistan; and it is traversed by immense caravans.

GOOLE, *gól*: thriving town and river-port of England, in the W. Riding of Yorkshire, on the Ouse, at its junction with the Don or Dutch river, 22 m. s.s.e. of York. The tract on which it stands, and by which it is surrounded, originally a swamp, has been industriously reclaimed and is a rich agricultural district. It has four docks in addition to the G. canal, also used for vessels; ponds for bonded timber, one of them capable of floating 3,000 loads, a large graving-dock; and extensive warehouse accommodation. About £ 00,000 worth of oil has been stored here at one time. Between 20 and 30 steamers leave the port weekly for Continental ports. G. is a terminus of the Lancashire and Yorkshire railway, and by it the Aire and Calder Navigation have extensive water carriage. More canal boats ply to and from G. than to and from any other place in the kingdom except Runcorn. The number of registered vessels belonging to the port (1880) was 341. The value of exports (1879) was £3,500,000; of imports, £2,500,000. Among imports are shoddy for manufacturing purposes, oil, logwood, timber, champagne, farm produce and groceries. Coal, cloth, and machinery are among the chief exports.

GOOR—GOOSANDER.

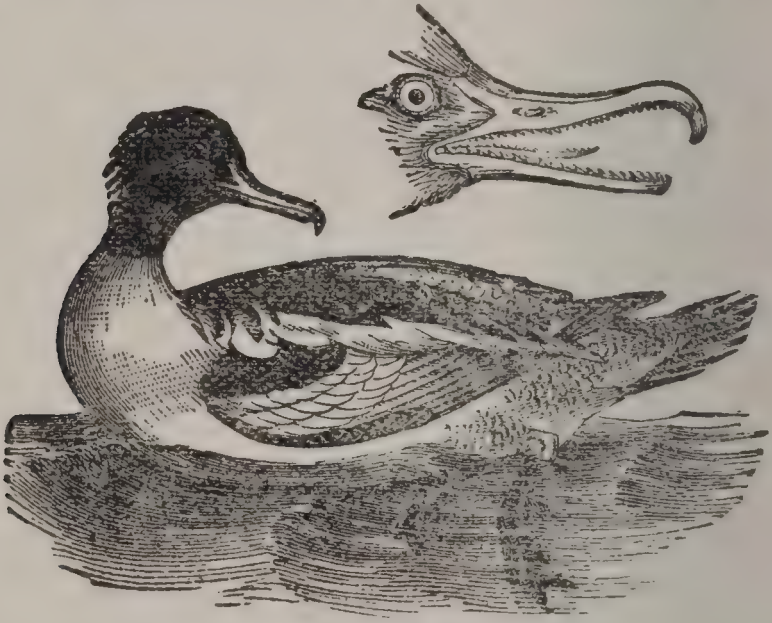
There are iron-foundries, alum and manure works, and corn-mills; ship and boat-building, sail-making, and agricultural machine-making are also extensively carried on. St. John's Church is a large handsome edifice, dating from 1848; there are seven Dissenting chapels and a Rom. Catholic chapel. Pop. (1871) 7,680; (1891) 15,413.

GOOR: see DZIGGETHAL.

GOORKHAS: see GORKHA.

GOOROO, n. *gô-rô'* [Hind. *gûrû*]: among the *Hindoos*, a spiritual guide.

GOOSANDER, *gós'an-der* (*Mergus Merganser*): web-footed bird of the same genus with those commonly called Mergansers (q.v.), and one of the large species. It is larger than a



Goosander (*Mergus Merganser*).

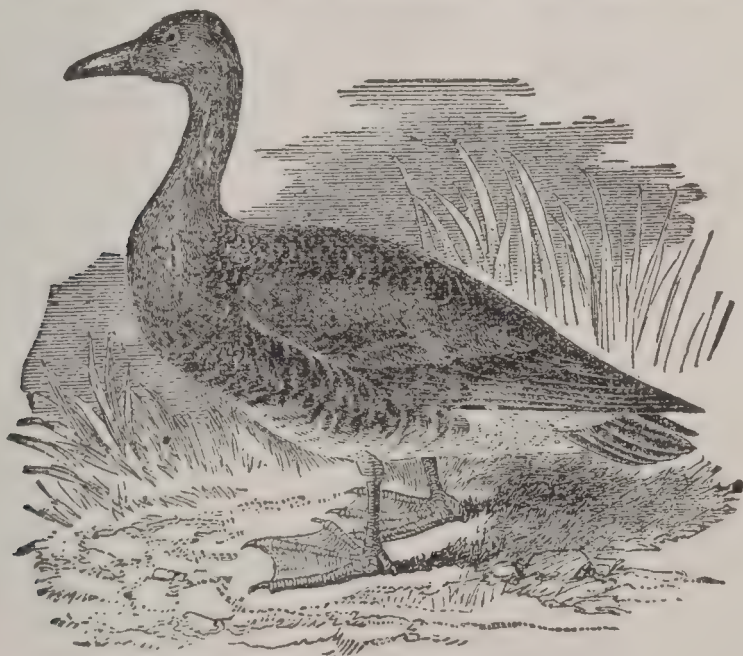
wild duck; the adult male has the head and upper part of the neck of a rich shining green; the feathers of the crown and back of the head elongated the back black and gray, the wings black and white, the breast and belly of delicate reddish buff color. The female has the head reddish brown, with a less decided tuft than the male, and much grayer plumage, and has been often described as a different species, receiving the English name of *Dundiver*. Both mandibles are furnished with many sharp serratures or teeth directed backwards (see accompanying illustration), the nearest approach to true teeth found in the mouth of any bird. (See also BILL). The G. is a native of the arctic regions, extending into the temperate parts of Europe, Asia, and America. In severe winter weather, the females and young migrate southward more frequently than the old males. It feeds on fish, crustaceans, and other aquatic animals which its serrated bill and its power of diving admirably adapt it for seizing. The flesh of the G. is extremely rank and coarse, but the eggs appear to be sought after by the inhabitants of some northern countries.

GOOSE.

GOOSE, n. *gós* [AS. *gos*; Low Ger. *goos*; Dan. *gaas*; Icel. *gás*; Pol. *ges*, a goose: Lith. *guz*, *guz*, cry to call geese]: a well-known web-footed bird; a silly person; a tailor's smoothing-iron. **GEESE**, n. plu. *gīs*. **GOOS'ERY**, n. *-ér-ī*, a place for geese; folly. **GOOSE-FOOT**, a native plant, so called from the shape of the leaf, forming several species of *Chenopodium*. **GOOSE-GRASS**, or **CLEAVERS**: see under **CLEAVE**. **GOOSE-QUILL**, a quill from a goose's wing, used for writing with. **TO COOK ONE'S GOOSE**, in *familiar language*, to do for one in the sense of cheating, befooling, or getting the better of. **GREEN-GOOSE**, a goose less than four months old.

GOOSE (*Anser*): genus of large, web-footed birds, usually classed as water-fowl and belonging to the same family, *Anatide*, as the duck and swan. The bill is large, but not long, high and broad with the upper mandible slightly curved at the tip. The legs are short and placed well forward, the neck rather long, and the wings large and powerful. Although an expert swimmer and diver the G. remains a large part of the time upon land, and can be successfully reared if only sufficient water for drinking purposes is provided, though free access to a pond or stream is always desirable.

Under the general term of Wild G. several varieties are included. Of these one of the most common in the old world is the Gray-legged G. (*A. ferus*), often called the Gray Lag G. By some naturalists this is supposed to be the parent stock of the domestic G., but the claim can hardly be sustained. It is not found in America. Among its characteristics are a marked preference for a comparatively mild climate, and a habit of visiting cultivated fields in the early spring, and seriously injuring the tender



Bean Goose (*Anas segetum*).

plants. This variety was formerly found in immense flocks in England, but the drainage, during the present century, of the great fens which had served as their breed-

GOOSE.

ing grounds has greatly diminished their numbers. The Bean G. (*A. Segetum*) closely resembles the preceding, but has somewhat darker plumage, a smaller and orange-colored bill, and longer wings. Vast numbers are found in n. Europe, Asia, and America. It visits warmer regions in winter, and often does great damage to wheat-fields in England and Scotland, and is destructive also to beans and peas. The White Fronted G. (*A. albifrons*) is very small, with gray plumage and a peculiar white spot on the forehead: it breeds in the Arctic regions, but visits warmer latitudes in winter. It appears in large flocks, and chooses marshes rather than cultivated districts. The Snow G. (*A. hyperboreus*) has its home in the Arctic regions: it is found in the largest numbers in America, and in winter migrates to the southern portion of the United States. It is of small size, has white plumage, and is highly prized for both its flesh and its feathers. The Canada G. (*A. Canadensis*) is found in vast numbers in N. America. It has also been long naturalized in Great Britain, and is one of the most beautiful varieties. On account of a peculiar white patch on the throat it is often called the Cravat G. It is easily tamed, and its flesh is highly esteemed. There are several other varieties of the wild G., which differ only in minor points from those above noted. Wild geese when migrating fly in wedge-shaped lines, closely following the leader, and keep up a peculiar cackling which can be heard for a long distance.

The G. is easily domesticated, and in this condition has been known from a very early period. Hieroglyphics show that it was largely kept and greatly prized by the ancient Egyptians. The Romans and other nations of an early period of civilization also gave considerable attention to its breeding and management. From early times it has been prized for its flesh and hardly less for its feathers. Before the invention of steel-pens the quills of the G. were in almost universal use for writing, and they are still to be found in large stationery stores. The feathers are of superior quality, and always find ready market. Though not so highly prized here as in Europe, the flesh of the G. is used to a considerable extent, and is growing in popularity. It is in special demand at the Christmas season. A remarkable peculiarity of the G. is seen in the fact that although it grows very rapidly and matures early, it lives to an advanced age. There are many well attested cases of life prolonged to 40 or 50 years, and in some instances a much greater age has undoubtedly been attained.

It is desirable that geese should have a wide range. They thrive better, and can be raised much cheaper than if kept in close quarters. A house should be provided for shelter at night and during the winter. About 2 sq. ft. of room should be allowed for each bird. The roosts should be low, the floor dry, and the room should be kept clean. Nests may be made in large boxes placed against the sides of the building in which the geese are kept. A gander must be kept for four or five geese; and many breed-

ers prefer to keep the birds in pairs. The number of eggs laid in a year varies greatly with the breed and the care which the birds receive, but may be said to range from 40 to 60. Unlike the hen the G. becomes a more prolific layer as it reaches maturity. It is also a much better breeder when two or three years old than at an earlier age: some breeds are said not to pair until they reach this age. The best period for hatching is from the middle of April to the middle of July, but if properly cared for later ones do well. Fifteen eggs are enough for one sitting. The period of incubation is about four weeks, varying slightly with the temperature. The nest should be deep, and food and water should be placed near it, in order that the G. may not be obliged to leave it and risk the spoiling of the eggs by their becoming chilled during her absence. If they hatch unevenly, the goslings that first break their shells may be removed from the nest in order that the G. may be contented to remain until the others are out. Many breeders prefer to place the eggs under a hen; others favor artificial incubation. Goslings should not be fed until they have been hatched about 24 hours. They may then be kept on eggs boiled hard and chopped very fine, boiled potatoes, bread soaked in milk, green grass, lettuce, or clover. A little Indian meal may be given, but it should be thoroughly cooked. As they grow older they can be allowed to forage largely for themselves, though they should be regularly provided with food at their houses. Until three weeks old they should not be allowed to go into water, and for a much longer time they should be kept from exposure to storms and from roaming in wet grass. They ought also be regularly housed at night. Geese should always be given plenty of green grass in summer, and in winter should have, in addition to grain, scraps of meat, turnips and cabbage chopped fine, and boiled potatoes. If kept in clean quarters and properly fed, the G. will not suffer from disease. When caring for their young, geese are inclined to be quarrelsome and should be kept from other poultry, as at such times they often destroy chickens and young turkeys. Geese should be fattened when not more than a year old. If well fed during the summer they can be made very fat by feeding, for a few weeks in the fall, all the cooked Indian meal and boiled potatoes that they will eat. Geese are very social birds, and fatten more readily when several are kept together than when alone. The celebrated *pâté de foie gras* is made from the enlarged livers of geese which have been kept in close and warm quarters, and stuffed with rich food.

Though the G. has been long domesticated there are comparatively few distinct breeds. Of these the Toulouse is one of the largest and best. The birds are hardy, and after the first year are good layers. When three years old and well fattened, they weigh 40 to 60 lbs. per pair. The Embden is nearly as large as the Toulouse, and is by some considered even more valuable. The Chinese geese are handsome, hardy, and good layers. The African and the

GOOSEBERRY.

Egyptian breeds are not common in the United States. The former is sometimes recommended for its value as food, etc., and the latter for its beauty. The Canada, or Wild G., is large, readily domesticated, and breeds freely with ordinary varieties.

GOOSEBERRY, n. *gúz'běr-rĭ* [Ger. *krausel-beere*, or *kraus-beere*—from *kraus*, crisp: Dut. *kroesen*, to curl—probably from the upright hairs which cover the fruit: OF. *groiselle*; Gael. *groiseid*, a gooseberry]: the well-known fruit of a prickly shrub; the fruit or the many varieties of the *Ribes grossulāriā*, ord. *Grossulāriācēæ* or *Ribesīacēæ*. GOOSEBERRY-FOOL, gooseberries stewed or scalded, pounded with cream, and sweetened.

GOOSEBERRY (*Grossularia*): fruit-bearing shrub with thorny and prickly stems, small leaves, green flowers, bell-shaped calyx, and producing large berries; closely related to the currant (q.v.). It is a native of Europe, Asia, and N. America, and is often found growing wild, especially in mountainous regions. The domestic G. (*Ribes grossularia*) is highly cultivated and very popular in England, where the cool, moist climate is favorable to its development to a high degree of perfection. In the United States the hot, dry summers render it liable to mildew, and it has never been largely grown. New, and more hardy varieties have recently been introduced, and interest in their cultivation is increasing. Plants should be set in rows about six ft. apart, and the plants four ft. apart in the row. The land should be rich and moist, but if naturally wet should be thoroughly underdrained. No weeds or grass should be allowed to grow in the plot devoted to this fruit. Fertilizers should be liberally applied each spring, and the soil should be thoroughly stirred with a cultivator several times during the season. The third year from planting, a good crop of fruit should be produced, and the plants should remain productive at least 20 years. If planted in a partially shaded position, the tendency to mildew is diminished. Mulching also acts as a preventive of this disease, and serves the additional purpose of mitigating the injurious effects of drought. As young wood yields the largest and finest fruit, the removal of old and weak stems is required. If the plants are a proper distance apart no other pruning will be needed, except in case of very rank growth, when the new wood may be shortened. If they are crowded, it may be necessary to remove part of the vigorous stalks. In ornamental gardens, the G. is often pruned in tree form, but this requires more labor than is needed for the natural bush form, and, except in appearance, secures no advantage. Propagation is easily effected by cuttings, and by layers. The former are usually preferred. They should be taken from new wood about Sep. 1. They should be about six inches in length, and immediately planted in a rich, moist soil down to the eye nearest the top. They should be placed about two inches apart, and the soil packed around them as closely as possible. Before cold weather comes they should be well mulched to pre-

GOOSEBERRY—GOOSE LAKE

vent injury by frost. Cuttings can be grown in the spring, but they do not make as vigorous plants as those started in the fall. The G. is principally used in a green state. Although it is very fine in quality and appearance, there is very little demand for the ripened fruit. The berries make excellent sauce, and if cooked just enough to burst the skins, and then put in ordinary fruit jars, they can be kept for an indefinite period. Sugar should not be added until the fruit is wanted for use. The green berries are largely used for pies and tarts. If care is taken that no bruised or imperfect specimens are put in, the green fruits can be kept, for a year at least, in ordinary bottles. The bottles should be nearly filled with berries, and the remaining space filled pure water. Cork tightly, and keep in a cool cellar. It is not necessary to either heat the water or seal the bottles. The number of varieties which are really good, and which thrive in this country, is quite small. Most of the sorts in high repute in England suffer so much from mildew as to be worthless here. Probably the Houghton seedling is the most widely cultivated. It is vigorous, hardy, and productive and yields a good quality of fruit. The Downing is a strong grower, very prolific, and is not liable to mildew. Smith's Improved has the advantage of a thin skin; the berries are large, and of excellent quality. The Industry is by far the most promising of the foreign varieties yet introduced; it is a vigorous grower, remarkably prolific and the fruit is large and of excellent flavor. If it endures the climate it will prove a great acquisition.

GOOSEBERRY, COROMANDEL: see CARAMBOLA.

GOOSEBERRY, PERUVIAN: see PHYSALIS.

GOOSEBERRY CATERPILLAR (*Nematus ventricosus*): Insect pest which infests both the gooseberry and the currant, and quickly destroys the leaves. It is a native of Europe, and was brought to this country from Canada 1857. The eggs are laid on the under side of the leaves, and the leaves nearest to the ground are usually chosen. The process of hatching occupies but a few days, and the worms soon commence their ravage. A second lot appears about the time the fruit is grown, and by removing the leaves prevent its ripening. Until recently the application of powdered hellebore has been the standard remedy. It is sprinkled upon the affected leaves when they are wet with dew. If removed by rain another application will be required. It is an active poison, and should be used with care. Of late, Pyrethrum powder has been used as a substitute for hellebore. It is said to be equally efficient, and it can be used freely and safely even when the fruit is ripening. It should be sprinkled over the leaves at night. Any remedy, in order to be serviceable, must be applied as soon as the first worms appear.

GOOSE-FISH: see ANGLER.

GOOSE LAKE: lake w. of the Warner Mts., in Jackson co., Or., and Siskiyou co., Cal.; intersected by the boundary line of those states; 30 m. long, 10 m. wide.

GOPHER—GOPHER WOOD.

Authorities differ as to the flow of its water, some claiming an outlet through Pitt river at the s. end, others that it has no outlet.

GOPHER, n. *gō'fēr* [F. *gaufre*, a honeycomb]: popular name of various burrowing animals. In the United States the word Gopher is applied to a species of rodents of the genera *Geomys* and *Thomomys*, sometimes called salamanders; to *Testudo polyphemus*, large land tortoise; to species of the rodent genus *Spermophilus*, locally known in Ill. as prairie squirrels; to the sub-family *Geomyinæ*, or pouched rats; and in Ga. to the colubroid snake. Among these there is but a single feature in common, the habit of burrowing into the earth for places of habitation and for secretion of food. To understand which of these species is meant in reading or conversation, it is essential to know in what part of the country the G. indicated is a habitant. The pouched G. is confined to N. America and almost exclusively to the region w. of the Miss. river. It is nocturnal, has a clumsy body, large claws on the fore feet for digging, and derives its name from the largely distended and overhanging or pouching cheeks. It averages 9 inches in length and 14 ounces in weight. In some portions of the west they are known as muloes (earth mice). The salamanders of the south, particularly of Ga., also known as hamsters, are larger than the pouched G., have longer fore than hind feet, and have similar burrowing claws. The genus *Spermophilus*, some species of which are known in Ill. and Cal. as prairie squirrels, and in n. Ill., Io., Wis., and Minn. as gophers, comprises a beautifully striped creature, 6 inches long, with a tail 4 inches long, in the Ill. region; and a mottled one, 11 inches long with a tail 8 inches long, in Cal. Both belong to the marmot family, and between them and the true marmots is another species known as prairie dogs, about 13 inches long and with tails of 4 inches. They bear no resemblance to a dog, but when frightened or at play among themselves make a chattering noise like a small dog. Though almost the shyest of all animals, they share their shallow domiciles with burrowing owls and rattlesnakes. The prairie squirrels and prairie dogs are very annoying to farmers and horticulturists. See Prof. Baird's *Report of the Pacific Railroad Expeditions*, VIII.; Kendall's *Narrative of the Santa Fé Expedition*.

GOPHER: burrowing land tortoise, genus *Testudo*, found in the s. states from the Savannah river to Fla. It is nocturnal, abounds chiefly in forests, but frequently makes its domicile in open fields, especially where potatoes, its favorite food, are cultivated. Its shell is from 13 to 14 inches in extreme length, oblong, remarkably compressed, grooved, and of a yellow-brown color. It is credited with enormous strength, for a creature of its size, and Dumeril and Briçon assert that it can move along comfortable with a man on its back. It burrows very deep, and its flesh and eggs are locally prized as food.

GOPHER WOOD, *gō'fēr wūd* [Heb. *gopher*]: wood of a tree not certainly identified: mentioned in Scripture as

GÖPPINGEN—GORAMY.

used in building Noah's ark. Its identity with the Cypress (q.v.) is maintained partly on account of the qualities of the wood, and partly on account of the agreement of the radical consonants of the names.

GÖPPINGEN, *göp-ping-en*: small town of the kingdom of Württemberg, on the right bank of the Fils, 27 m. n.w. from Ulm. It is a station on the railway from Ulm to Stuttgart; and is an industrious, cleanly, and flourishing town, possessing a town-hall, a large castle, and mineral baths; and carrying on manufacture of woollen cloth, earthen-ware, and some trade in wool. Pop. (1900) 19,384.

GORAKHPUR, or GORUCKPORE, *go-rūk-pōr*: dist. of the N.W. Provinces, India; bounded n. by Nepaul, e. by Champáran and Sáran. s. by the Gogra river, w. by Basti and Fyzabad; lat. $26^{\circ} 50' 15''$ — $27^{\circ} 28' 48''$ n., long. $83^{\circ} 7' 81' 29'$ e, 4,578 sq. m.; cap. Gorakhpur. Its surface in general is level, dense forests abound in the n. and centre, and excepting at the foot of the Himalayas, which is bordered by a marshy tract of unhealthful jungle, most of the dist. is very fertile and well cultivated. G. is drained by the Rapti, Gogra, great and little Gandak, Kánua, Rolim, Ami, and Gunghi rivers, and there are numerous lakes well stocked with fish. The chief products are cotton, rice, and a variety of foodstuffs, and commerce is confined to those articles. In 1875, there were 435 schools with 13,525 pupils, and the death rate was 19.85 per 1,000 of population. The founder of the Buddhist religion died in the dist. of G., which thus became the headquarters of the new creed. For many centuries it was the scene of continual strife. It was included in the territory ceded by Oudh to the British under the treaty of 1801, seized by the rebels during the great mutiny, regained by friendly Gurkhas, and again passed under British rule. Pop. about 2,750,000, nine-tenths Hindus.

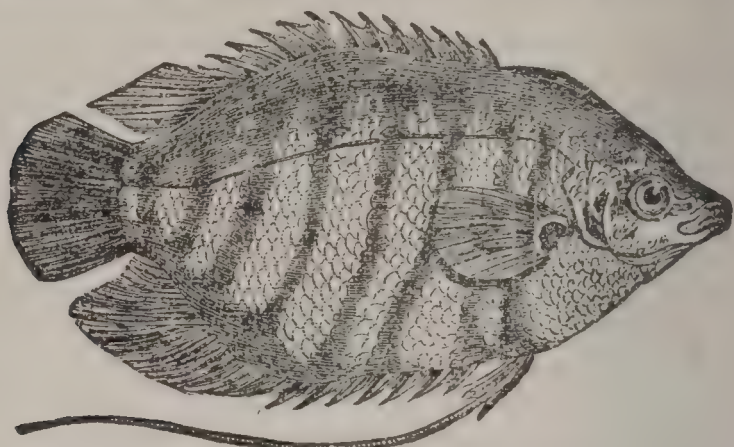
GORAKHPUR, *gō-rūk-pōr'*, or GORUCKPORE, *gō-rūk-pōr'*: city, cap. of a dist. in the N.W. Provinces of India, on the left bank of the Rapti, which joins the Ghagra, 85 m. below. It is 430 m. n.w. of Calcutta. Pop. (1881) 57,922; (1901) 64,148.

GORAL, *gōr'al* (*Antelope Goral*, or *Nemorhedus Goral*): animal of the antelope family, inhabiting in large herds the elevated plains of Nepaul. It is of a grayish-brown color, dotted with black, the cheeks white; the hair is short; the horns are short, inclined, recurved, and pointed. It is wild and fleet, and when pursued, takes refuge in rocky heights. Its flesh is highly esteemed.

GORAMY, *gōr'a-mī*, or GOURAMI, *gōr'a-mē* (*Osphromenus olfax*): fish of the family *Anabasiæ* or *Labyrinthi-branchiæ*, native of China and the Eastern archipelago, highly esteemed for the table, and on that account introduced into Mauritius, Cayenne, and the French W. India Islands. Its form is deep in proportion to its length, the head small, and terminating in a rather sharp short snout, the mouth small, the tail rounded, the dorsal and anal fins having numerous rather short spines, the first ray of

GORBELLIED—GORDIAN-KNOT.

the ventral fins extending into a very long filament. It is sometimes kept in large jars by the Dutch residents in Java, and fed on water-plants. It was introduced into Mauritius about the middle of the 18th c., and soon spread



Goramy (*Osphromenus olfax*).

from the tanks in which at first it was kept into the streams, multiplying abundantly. This success is an encouragement to other attempts. The G, is interesting on other accounts. It is one of the nest-building fishes, and at the breeding season forms its nest by entangling the stems and leaves of aquatic grasses. Both the male and female watch the nest for a month or more with vigilance, and violently drive away every other fish which approaches, till the spawn is hatched, afterward affording a similar parental protection to the young fry.

GORBELLIED, a. *gôr-bèl'id* [Eng. *gore*, clotted blood, filth, and *belly*: Gael. *gaor*, to cram, to glut; *gaorran*, a big belly: comp. prov. Sw. *gar-balg*, a fat paunch]: in *OE.*, having a fat belly. **GORCROW**, n. *gôr-krô* [Eng. *crow*]: the common or carrion crow.

GORCOCK, n. *gôr'kôk* [from *gorse*, furze; or imitative of the sound it utters]: the moor-cock or grouse.

GORCUM: see **GORKUM**.

GORDIAN-KNOT, *gawr'dî-an-nôt*: Gordius, Phrygian peasant, was plowing in his fields, when an eagle settled on his yoke of oxen, and remained till the labor of the day was over. He sought an explanation of so wonderful a phenomenon, and was informed by a prophetess of Telmissus that he should offer sacrifice to Zeus. He did so; and then married the prophetess, by whom he had a son, the famous Midas. When Midas grew up, disturbances broke out in Phrygia, and the people sent messengers to the oracle at Delphi, to ask about choosing a new king. The messengers were informed that a king would come to them riding on a car, and that he would restore peace. Returning to Phrygia, they announced these things, and while the people were talking about them, Gordius, with his father, opportunely arrived in the requisite manner. He was immediately elected king, whereupon he dedicated his car and yoke to Zeus, in the acropolis of a Gordium (a city named after himself, in Bithynia, not far from the river

GORDIANUS.

Sangarius), tying the knot of the yoke in so skilful a manner, that an oracle declared whoever should unloose it would be ruler of all Asia. When Alexander the Great came to Gordium, he cut the knot in two with his sword, and applied the prophecy to himself. Hence, a *G. K.* denotes any inextricable difficulty or problem: to *cut the G. K.*, to solve or overcome a difficulty in a bold decisive manner.

GORDIANUS, *gawr-dī-ā'nūs*, or GORDIAN: name of three Roman emperors, father, son, and grandson.

The first, MARCUS ANTONIUS AFRICANUS G., was grandson of Annianus Severus, and was descended by the father's side from the famous family of the Gracchi. He was remarkable for his attachment to literary pursuits. After being ædile, in which capacity he celebrated the gladiatorial sports with great magnificence, he twice filled the office of consul, first as the colleague of Caracalla; A.D., 213; second, as the colleague of Alexander Severus. Soon afterward, he was appointed proconsul to Africa, where he gained the affections and esteem of the people by his modest and gentle manners, his splendid liberality, and his refined literary taste; his old age was spent in the study of Plato, Aristotle, Cicero, and Vigil.—The tyranny and injustice of Emperor Maximinus having at length excited a rebellion against his authority in Africa, the imperial procurator there was murdered by a band of nobles who had formed a conspiracy against him on account of his cruelty. G., now in his 80th year, was proclaimed emperor, after having vainly refused the dangerous honor. He received the title of *Africanus*, and his son was conjoined with him in the exercise of imperial duty. The Roman senate acknowledged both, and proclaimed Maximinus, then absent in Pannonia, an enemy to his country. The younger G., however, was defeated in battle by Capellianus, viceroy of Mauritania, before Carthage, and his father, in an agony of grief, killed himself, having been emperor for 36 days. In his personal appearance, G. is said to have greatly resembled Augustus.

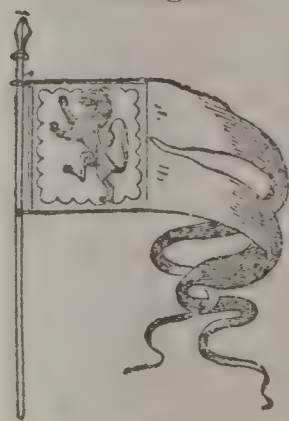
MARCUS ANTONIUS G PIUS, grandson of the preceding, was raised to the dignity of Cæsar, with Pupienus, Maximus, and Balbinus, who also were elected emperors in opposition to Maximinus; and, in the same year, after the other imperial claimants had fallen by the hands of their own soldiers. Marcus Antonius G., then a boy 13 years of age, was elevated by the Prætorian bands to the rank of Augustus. Assisted by his father-in-law, Misitheus, a man distinguished for wisdom, virtue, and courage, whom he made prefect of the Prætorians, he marched, in 242, into Asia, against the Persians, who, under Shahpûr (Sapor), had taken possession of Mesopotamia, and had advanced into Syria. Antioch, threatened by them, was relieved by G., the Persians were obliged to withdraw from Syria beyond the Euphrates, and G. was just about to march into their country, when Misitheus died, and the young emperor lost his main prop. Philip the Arabian, who succeeded Misitheus, stirred up dissatisfaction in the



Gomuto Palm (*Saguerus saccharifera*).



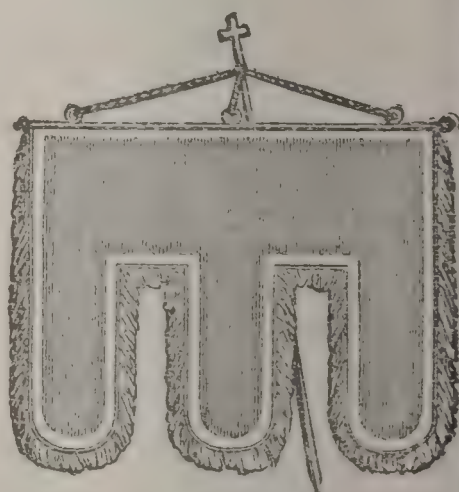
Gorget.



Gonfalon.



Gooseberry Caterpillar.—Gooseberry Saw-fly (*Nematus ribesii*): a, Adult fly; b, Natural size; c, Larva; d, Pupa.



Gonfalon. Another specimen.



Gooseberry Caterpillar.—The Magpie Moth (*Abraxas grossulariata*): a, Caterpillar; b, Chrysalis.



Gorget.



Plate Gorget.

GORDIUS.

army against G. by the foulest treachery, and finally goaded on the ignorant and passionate soldiery to assassinate the emperor, 244. But knowing the great affection which the Roman people had for the gallant and amiable G., he declared in his despatch to the senate that the latter had died a natural death, and that he himself had been unanimously chosen to succeed him.

GORDIUS, *gawr'dī-ūs*: genus of *Annelida*, of the very simplest structure; very much elongated and thread-like, with no greater marks of articulation than slight transverse folds, no feet, no gills, no tentacles, though there is a knotted nervous chord. The mouth is a mere pore at one end of the animal; the other end or tail is slightly bitd, and has been often mistaken for the head. The species inhabit moist situations, are sometimes found on leaves of plants, but more frequently in stagnant pools, and in mud or soft clay, through which they work their way with great ease. They often twist themselves into complex knots, whence their name G., from the celebrated *Gordian-knot*—and many of them are sometimes found thus twisted together; but they are often found also extended in the water. Of one species, *G. aquaticus* the popular name is HAIR EEL; and a notion still prevails in many places that it is nothing else than a horse-hair, which has somehow acquired life by long immersion in water, and which is destined in due course of time to become an eel of the ordinary kind and dimensions; in proof of all which many an honest observer is ready to present himself as an eye-witness who has often seen these very slender eels in his walks. A popular notion prevails in Sweden, that the bite of the G. causes whitlow. When the pools in which the G. lives are dried up, it becomes shrivelled, and apparently lifeless, but revives on the application of moisture. The Abbé Fontana kept one in a drawer for three years, and though perfectly dry and hard, it soon recovered vigor on being put into water. Gordii are extremely common in the English river Thames.

GORDON.

GORDON, *gawr'don*, ADONIRAM JUDSON, D.D.: Bapt minister: b. New Hampton, N. H., 1836, Apr. 19. He graduated at Brown Univ. 1860, and Newton Theol. Seminary 1863; was ordained pastor of a Bapt. church in Jamaica Plain, Mass., 1863, and of the Clarendon Street Bapt. Church in Boston 1869; published *Grace and Glory* (1880), *In Christ* (1872), *Ministry of Healing* (1882), *Two-fold Life* (1884); was one of the compilers of the *Service of Song* (hymns); and received the degree D.D. from Brown Univ. 1877. He d. 1895, Feb. 2.

GORDON, *gawr'don*, CHARLES GEORGE ('Chinese Gordon'—'Gordon Pasha'): 1833, Jan. 28—1885, Jan. 26; b. Woolwich, England; of Scottish ancestry. From school at Taunton he passed in 1847 to the Woolwich Military Acad., 1852 entered the Engineers, and after two years' desk-work at Pembroke, spent eight months in the Sebastopol trenches (1855). 1856–58 he was laying down the new Russo-Turkish frontiers in Bessarabia and Armenia; and 1860 he sailed for China, in time to be present at the surrender of Peking, and the burning of the Summer Palace. In the service of China herself, he commanded the 'Ever Victorious Army,' a native force 3,000 to 5,000 strong, with 150 European officers, which, under him, in a 16 months' campaign (1863–4), suppressed the rebellious Tae-Pings (q.v.), taking four cities and a dozen minor strong places, and repeatedly routing an enemy at least 15 times stronger than itself. Gordon himself went always unarmed, except for a cane (his 'wand of victory'), and, never but once being wounded, was thought to bear a charmed life. China he left as poor as he had entered it, but with its highest military title, a Yellow Jacket, and a Peacock's Feather; his own country created him a C.B., and a lieutenant-colonel. 1865–71 he was working at Gravesend on the Thames defenses, and on the schooling of little Thames 'mud-larks'; he was British commissioner on the Danube at Galatz (1871–73); next, in Egypt's service, he toiled and strove to put down slave-hunting in the Soudan, and made the people love him (1874–79). In 1880 he sailed for India as private sec. with Lord Ripon, but gave up the post on reaching Bombay, and went straight on to China, which his wise counsels saved from going to war with Russia. Chief engineer in Mauritius, with the rank now of maj.gen. (1881–2), he wasted five months of the latter year in s. Africa, failing, through any one's fault but his own, to settle the Basuto difficulty. After a well-earned holiday in Palestine, he had just undertaken for the king of the Belgians an anti-slavery expedition to the Congo, when, 1884, Jan. 18, the British govt. dispatched him to Khartoum, to extricate the Egyptian garrisons in the Soudan, then menaced by the revolt of the Mahdi. He started by that night's mail, and reached Khartoum Feb. 18, having crossed the desert almost alone. For a while he seemed to be working, he did work, wonders toward the peaceful attainment of his difficult mission; its greatest difficulty being that he was neither told how he should act, nor allowed to act for himself. In March he commenced the

heroic nine months' defense, of Kartoum with miserable troops, against the wild hordes that taxed the manhood of England's bravest veterans; 1885, Jan. 28, the van of Lord Wolseley's rescue expedition reached Khartoum on Gordon's own steamers, to find that it had fallen two days earlier, and that Gordon was with the slain. Such was the end of 'Chinese Gordon'—'knight without fear and reproach,' the Sir Galahad, of the 19th century. See Andrew Wilson's *Ever Victorious Army* (1868); Birkbeck Hill's *G. in Central Africa* (1881); G.'s own *Reflections in Palestine* (1884), and *Last Journals* (1885); and the *Lives by Hake* (2 vols. 1884-5), by Archibald Forbes (1884), and by G.'s brother, Sir Henry G. (1886).

GORDON, FAMILY OF: a great Scottish historical house. Its origin is not free from obscurity. Uncritical genealogists of the 17th c. affected to trace its descent from a mythical high constable of Charlemagne, a Duke of Gordon, who, it was said, flourished about 800, and drew his lineage from the Gordoni, a tribe which, taking its name from the town of Gordunia, in Macedonia, had settled in Gaul before the days of Julius Cæsar. These fables and fancies have long ceased to be believed. Nor is more credit given to the conjecture that the family, having carried its name from Normandy to England in the train of the Conqueror, soon afterward passed on from England to Scotland. No proof has been found of any connection between the Gordons of France and the Gordons of Scotland. There is little or no doubt now that the Scottish Gordons took their name from the lands of Gordon in Berwickshire. Their earliest historian, writing in the 16th c., says that these lands, together with the arms of three boars' heads, were given by King Malcolm Ceanmohr (1057-93) to the progenitor of the house, as a reward for slaying, in the forest of Huntly, a wild boar, the terror of all the Merse. But in the 11th c., there were neither heraldic bearings in Scotland nor Gordons in Berwickshire. The first trace of the family is about the end of the 12th or the beginning of the 13th c., when it appears in record as witnessing charters by the great Earls of March or Dunbar, and as granting patches of land and rights of pasturage to the monks of Kelso. About a century afterwards, it enters the page of history in the person of Sir Adam of Gordon. He is found, 1305, high in the confidence of King Edward I. of England, holding under that prince the office of joint justiciar of Lothian, and sitting in the English council at Westminster as one of the representatives of Scotland. He seems to have been among the last to join the banner of Bruce, who rewarded his adherence, tardy as it was, by a grant of the northern lordship of Strathbogie. The grant failed of effect at the time; but it was renewed by King David II. 1357, and by King Robert II. 1376. Under this last renewal, Sir John of Gordon, great-grandson of Sir Adam, entered into possession, and so transferred the chief seat and power of the family from the Merse and Teviotdale to the banks of the Dee, the Deveron, and the Spey. Its direct male line came

to an end in his son Sir Adam, who fell at Homildon 1402, leaving an only child, a daughter, to inherit his lands, but transmitting his name through two illegitimate brothers—John of Gordon of Scurdargue, and Thomas of Gordon of Ruthven—to a wide circle of the gentry of Mar, Buchan, and Strathbogie, who, calling themselves ‘Gordons,’ styled the descendants of their niece ‘Seton-Gordons.’

LORDS OF GORDON AND BADENOCH, EARLS OF HUNTLY, MARQUISES OF HUNTLY, AND DUKES OF GORDON.—Elizabeth of Gordon, heiress of Sir Adam, married before 1408 Alexander of Seton (son of Sir William of Seton), who, before 1437, was created Lord of Gordon. Their son Alexander, who took the name of Gordon, was made Earl of Huntly 1445, and Lord of Badenoch a few years afterward. He acquired by marriage the baronies of Cluny, Aboyne, and Glenmuick in Aberdeenshire; and had grants from the crown of the Highland lordship of Badenoch, and of other lands in the counties of Inverness and Moray. He died 1470, and was succeeded by his second son George, the second earl, who married Annabella, daughter of King James I.; was chancellor of Scotland 1498–1502, and dying soon afterward, was succeeded by his son Alexander, third earl, who enlarged the family domains. He commanded the left wing of the Scottish army at Flodden; and, escaping the carnage of that disastrous field, survived till 1524. He was succeeded by his grandson George, fourth earl, under whom the family reached, perhaps, its highest pitch of power. He added the earldom of Moray to its already vast possessions, and long held the great offices of lieutenant of the north and chancellor of the realm. He had the repute of being the wisest, wealthiest, and most powerful subject in Scotland. The crown, it is said, was counselled to clip his wings, lest he should attempt, like the Douglasses in the previous age, to awe or overshadow the throne. He was stripped of the earldom of Moray, and, rushing into revolt, was routed and slain at Corrichie 1562. Sentence of forfeiture was pronounced upon his corpse, but it was rescinded 1567, and his son George succeeded as fifth earl: he died 1576. The family had stood aloof from the Reformation, and his son and successor, George, the sixth earl, was conspicuous as the head of the Rom. Cath. power in Scotland. He defeated a Protestant army sent against him under the Earl of Argyle 1594; but submitting to the king, obtained an easy pardon, and was made Marquis of Huntly 1599: he died 1636. We mark a new social stage when we are told that he was the first head of his house who ‘bought’ land. His son George, the second marquis, distinguished himself by the zeal with which he espoused the royal cause in the great civil war of his time. ‘You may take my head from my shoulders,’ he said, in answer to tempting offers from the Covenanters, ‘but not my heart from the king.’ Such was the state he kept, that when he took up house in Aberdeen 1639, he was attended daily by 24 gentlemen, of whom three were of the rank of barons, while eight gentlemen were charged with the

watch of his mansion by night. He was beheaded at Edinburgh 1649, and was succeeded by his son Lewis, third marquis, who died 1653. The family possessions had been impaired by war and forfeiture, but it appears that they still sufficed, in 1667, to yield £24,771 Scots a year to his son George, fourth marquis, who was made Duke of Gordon 1684. He held out the castle of Edinburgh for King James at the revolution; and dying 1716, was succeeded by his son Alexander, the second duke, who died 1728. He was the last Rom. Cath. chief of his race, and, as we are told by Boswell, lived 'in sequestered magnificence, corresponding with the grand dukes of Tuscany,' with whom he believed that he could count kindred. He never travelled in the north without a train of his vassals on horseback. His son, Cosmo George, third duke, died 1752, leaving three sons. The youngest, Lord George Gordon, led the Protestant mob which sacked London 1780 (see GORDON, LORD GEORGE); the eldest, Alexander, the fourth duke, died 1827, being succeeded by his son George, fifth duke, on whose death, without issue, 1836, the title of Duke of Gordon (being limited to the heirs-male of the body of the first duke) became extinct, the title of Earl of Huntly fell into abeyance, and the title of Marquis of Huntly was adjudged to the Earl of Aboyne, as heir-male of the body of the first marquis. The estates went to the duke's nephew, Charles, fifth Duke of Richmond and Lennox, grandson of the fourth Duke of Gordon, and his wife, the sprightly Jane Maxwell, daughter of Sir William Maxwell of Monreith. The title of Duke of Gordon was revived 1876 in the person of the sixth Duke of Richmond.

VISCOUNT OF MELGUND, VISCOUNTS OF ABOYNE, EARLS OF ABOYNE, AND MARQUISES OF HUNTLY.—Lord John Gordon, second son of the first Marquis of Huntly, was made Viscount of Melgund and Lord Aboyne 1627. Three years afterward he was burned to death in the tower of Frendraught. In 1632, his elder brother, George, was made Viscount of Aboyne, and on his succession to the Marquisate of Huntly 1636, the title of Viscount of Aboyne devolved on his third son, who distinguished himself on the king's side during the wars of the covenant, and died, it is said, of a broken heart, a few days after the execution of Charles I., 1649. Lord Charles Gordon, third son of the second Marquis of Huntly, was made Earl of Aboyne 1660. His great-great-grandson, George, who had been a favorite at the court of Marie Antoinette, succeeded as fifth Earl of Aboyne 1794, on the death of his father, and as eighth Marquis of Huntly 1836, on the death of the fifth Duke of Gordon.

EARLS OF SUTHERLAND.—About 1512, Adam Gordon of Aboyne, second son of the second Earl of Huntly, married Elizabeth, heiress of Sutherland, and in her right became Earl of Sutherland. Neither he nor his wife, it appears, could write their own names. Their descendants, the Earls of Sutherland, continued to bear the surname of Gordon through six or seven generations, till the beginning

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of the 18th c., when they exchanged it for the surname of Sutherland, which had been borne by the Countess Elizabeth before her marriage with Adam Gordon.

LORDS OF LOCHINVAR AND VISCOUNTS OF KENMURE.—William of Gordon, second son of Sir Adam of Gordon, who figured in the reign of King Robert I. (1306-29), had a grant from his father of the barony of Stichel, in Teviotdale, and of the lands of Glenkens, in Galloway. He was the progenitor of the knightly family of Lochinvar, which 1633 was raised to the peerage by the titles of Lord of Lochinvar and Viscount of Kenmure. William, sixth viscount—the *Kenmure's on and awa'* of Jacobite song—was beheaded 1716 for his share in the rising of the previous year. The peerage, which was then forfeited, was restored 1824, but has been in abeyance since the death of Adam, ninth Viscount, 1847.

EARLS OF ABERDEEN.—Some genealogists have sought to ingraft this branch on the parent stem before it was transplanted to the north toward the end of the 14th c.; but no evidence has been produced in support of this claim; and modern research holds by the old tradition that the house descends from one of the illegitimate brothers of Sir Adam of Gordon, slain at Homildon 1402. Its first possession seems to have been Methlic on the banks of the Ythan. Patrick Gordon of Methlic fell under the banner of the Earl of Huntly at the battle of Arbroath 1445. His son and successor was of sufficient mark to obtain the bishopric of Aberdeen for one of his youngersons 1516. The family reached the rank of lesser baron 1531, and the dignity of knight-baronet 1642. Its chief, at this last date—Sir John Gordon of Haddo—one of the most gallant of the northern cavaliers, was the proto-martyr of his party, the first of the royalists who suffered death by a judicial sentence. He was beheaded at the cross of Edinburgh by the Covenanters 1644, bequeathing the name of 'Haddy's Hole' to one of the aisles of St Giles's church, which had been his prison. His son, Sir George Gordon of Haddo, after distinguishing himself at the university and the bar, was made a lord of session 1680, lord president of the court 1681, and lord chancellor in the following year. He was raised to the peerage 1682, by the titles of Earl of Aberdeen, Viscount of Formartine, Lord Haddo, Methlic, Tarves, and Kellie. He died 1720, with the character of being 'a solid statesman, a fine orator, speaking slow but strong.' Some of these lineaments, it has been thought, reappeared, with his love of letters, in his great-great-grandson, George, fourth Earl of Aberdeen, who died 1860, after holding the office of prime minister of the United Kingdom 1852, Dec.—1855, Feb. (see ABERDEEN, GEORGE HAMILTON GORDON, Earl of).

A History of the Ancient, Noble, and Illustrious Family of Gordon, by William Gordon, of old Aberdeen, was published Edinburgh 1726-7, 2 vols. 8vo. *A Concise History of the Ancient and Illustrious House of Gordon*, by C. A. Gordon, appeared at Aberdeen, 1 vol. 12 mo. 1754. The chief value of both books is now in their rarity. A work

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of much greater merit is the *Genealogical History of the Earldom of Sutherland*, published Edinburgh 1813, 1 vol. fol. It was written 1639, by Sir Robert Gordon of Gordonstoun, fourth son of the twelfth Earl of Sutherland by his marriage with that Lady Jane Gordon (daughter of the fourth Earl of Huntly), who was divorced from the infamous Earl Bothwell, that he might marry Mary Queen of Scots. With Sir Robert Gordon's work, there is printed a continuation of it to 1651, by Gilbert Gordon of Sallach. We learn from this sequel that the House of Gordon of Gight (claiming descent from a younger son of the second Earl of Huntly), which gave birth, at the end of the 18th c., to the poet George Gordon, Lord Byron, gave birth, at the end of the 16th c., to one of the assassins of Wallenstein, Col. John Gordon, governor of Eger, in Bohemia.

GORDON, Lord GEORGE: celebrated in connection with the London Prot. riots 1780: 1750, Sep. 19—1793, Nov. 1; b. London; third son of the third Duke of Gordon: see GORDON, FAMILY OF (Lords of Gordon and Badenoch). At an early age he entered the British navy, and rose to the rank of lieut., but quitted the service during the American war, in consequence of a dispute with the Admiralty relative to promotion. Elected 1774 M.P. for Luggershall, he soon rendered himself conspicuous by his opposition to the ministers, and the freedom with which he attacked all parties; but though eccentric he showed ability in debate, and no deficiency of wit or argument. A bill having passed the legislature 1778 for the relief of Rom. Catholics from certain penalties and disabilities, the Prot. association of London was formed to procure its repeal; and 1779, Nov., G. was elected its president. In 1780, June, he headed a vast and excited mob, of about 100,000 persons, which went in procession to the house of commons, to present a petition against the measure, when he addressed them in a speech calculated to inflame their passions and bigotry. Dreadful riots ensued in the metropolis, lasting several days, in the course of which many Rom. Cath. chapels and private dwelling-houses, Newgate prison, and the mansion of the chief-justice, Lord Mansfield, were destroyed. G. was arrested, and tried for high treason; but no evidence being adduced of treasonable design, he was acquitted. His subsequent conduct seemed that of a person of unsound mind. Having, 1786, refused to come forward as a witness in a court of law, he was excommunicated by the Abp. of Canterbury for contempt. In 1786, he was convicted, on two official informations, for a pamphlet reflecting on the laws and criminal justice of the country, and for publishing a libel on the queen of France (Marie Antoinette) and the French ambassador in London. To evade sentence he retired to Holland, but was sent back to England, arrested at Birmingham, and died of fever in Newgate prison. He had latterly become a proselyte to Judaism.

GORDON, GEORGE ANGIER, D.D.: Congl. minister: b. Scotland, 1853. He came in youth to this country, settling

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in South Boston in a mechanical avocation; but was induced to turn his attention to the ministry, and entered Bangor Theol. Seminary. He graduated 1877, held a brief pastorate in a Congl. church in Me., which he resigned for the purpose of further study; entered Harvard Univ., and graduated 1881, taking very high rank. He was installed pastor of the second Congl. church, Greenwich, Conn., and after repeated overtures accepted a call from the Old South church in Boston, 1884.

GORDON, JOHN BROWN: soldier and public official: b. Upson co., Ga., 1832. Feb. 6. He was educated at the Univ. of Ga., studied law, was admitted to the bar, and practiced in Atlanta till the beginning of the rebellion, when he entered the confederate army as a capt. of infantry. He was rapidly promoted to rank of lieut.gen., had command of the 2d confederate army corps, and at the time of Gen. Lee's surrender commanded a wing of the army of n. Va. He received eight wounds in battle during the war. After the surrender he returned to Ga., was democratic candidate for gov. 1868, but though his party claimed his election by a large majority, Rufus B. Bullock, his republican opponent, was declared elected. The same year he was a member of the national democratic convention and was elected presidential elector for the state at large, and similarly in 1872. 1873 was elected U. S. Senator; 1879 re-elected; 1880 resigned; gov. of Ga. 1886-90; re-elected U. S. Senator, 1891; became commander-in-chief, United Confederate Veterans, 1900.

GORDON, Sir JOHN WATSON: president of the Royal Scottish Acad.: 1788-1864, June 1; b. Edinburgh; son of a capt. in the navy. He studied for four years with the desire to become a historical painter, but ultimately turned to portraiture, in which he achieved distinguished reputation. G. continued to reside in his native city. He exhibited in the Royal Scottish Acad. 1827, was elected 1841 an associate, 1850 an academician of the London Royal Acad.; and on the death of Sir William Allan, pres. of the Royal Scottish Acad., when the honor of knighthood was conferred on him. G. was as national in his art as it is possible for a portrait-painter to be—i.e., he excelled in transferring to the canvas those lineaments of character which are deemed pre-eminently Scotch.

GORDON, JOSEPH CLAYBAUGH: an Am. educator: b. in Piqua, O., 1842. Mar. 9; was graduated at Monmouth College, Ill., 1866. He was the pioneer teacher in oral education in the United States. In 1869 he organized the oral department in the Indiana Institution for the Deaf; was prof. of mathematics and chemistry at Gallaudet College, Washington, D. C., 1873-97. In the latter year he was appointed superintendent of the Illinois Institution for the Education of the Deaf. He became a member of several educational societies. His publications include *Notes and Observations on the Education of the Deaf*; *Education of Deaf Children*; etc.

GORDON, General PATRICK: one of the most distinguished of the many soldiers of fortune whom Scotland

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sent to the wars of Europe: 1635, Mar. 31—1699, Nov. 29, b. at Easter Auchleuchries, a bleak homestead on the e. coast of Aberdeenshire. His father, a 'goodman' or yeoman, was grandson of the family of Gordon of Haddo, afterwards raised to the earldom of Aberdeen. His mother, an Ogilvie, was heiress of Auchleuchries, an estate of five or six petty farms, worth in those days about £360 Scots, or £30 sterling a year, and hopelessly burdened by mortgages. In his fifth year, G. was sent to the neighboring parish school, where he seems to have got a fair knowledge of Latin. The university was closed against him by his devotion to the Rom. Cath. faith of his mother; and so at the age of 16, he resolved to go to some foreign country. He went to Danzig 1651, and some Scottish acquaintances or kinsfolks placed him at the Jesuit college of Braunsberg. His restless temper could not long endure the stillness and austerity of that retreat, and escaping 1653, he led an unsettled life, until, 1655, he enlisted under the flag of Sweden, then at war with Poland. During the six years of that war in the struggle between these two powers, he was repeatedly made prisoner, and as often took service with his captors, until again retaken. He had risen to the rank of capt. lieutenant when he resolved to try his fortune next with the czar, and, 1661, joined the Muscovite standard.

Here his services in disciplining the Russian soldiers were appreciated, and his rise was rapid. He was made lieutenant-col. 1662, col. 1665. Hearing that the death of his elder brother had made him 'goodman of Auchleuchries,' he wished once more to return to Scotland; but he found that there was no escape from the Russian service. The czar, however, sent him on a mission to England, 1666. On his return, he fell into disgrace, for some reason not known. In 1670, he was sent to serve in the Ukraine against the technical manner by many critics, and various theories Cossacks; and when these were subdued, he was sent back, 1677, to defend Tschigirin against the Turks and the Tartars. His gallant performance of that duty gained him high military reputation and the rank of major-general. In 1683, he was made lieutenant-general; and two years afterward he obtained leave to visit England and Scotland. King James II. wished him to enter the English service; but it was in vain that he petitioned for leave to quit Russia. In 1688, he was made general, and now began his intimacy with the Czar Peter, who, in the following year, owed to G.'s zeal and courage his signal triumph over the conspirators against his throne and life. Nor was this G.'s only great service to his imperial master. In 1698, he crushed the revolt of the Strelitzes during the czar's absence from Russia. Peter was not ungrateful, and G.'s last years were passed in opulence and honor. He died in Moscow. 'The czar,' says his latest biographer, 'who had visited him five times in his illness, and had been twice with him during the night, stood weeping by his bed as he drew his last breath; and the eyes of him who had left Scotland a poor unfriended wanderer, were closed by the hands of an emperor.'

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An abridgment of his journal kept through his last 40 years, filling 8 or 10 thick quartos, was pub. (in German under the title *Tagebuch des Generals Patrick Gordon*), at Moscow and St. Petersburg, 3 vols. 8vo, 1849, '51, '53, carefully edited by Dr. Posselt. In 1859, *Passages from the Diary of General Patrick Gordon*, edited by Mr. Joseph Robertson, were printed by the Spalding Club, 1 vol. 4to.

GOR'DON, WILLIAM: 1730-1807, Oct. 19; b. Hitchin, England: Cong'l minister. After having charge of two independent societies in England, he came to America 1770, became pastor of the Third Church in Roxbury, Mass. 1772, July 6, and chaplain to the provincial congress of Mass., was dismissed by the legislature for his political sentiments, and returned to England 1786. He published *History of the Rise, Progress, and Establishment of the Independence of the United States*, 5 vols. (London 1788), and while in Mass. *A Plan of a Society for making Provision for Widows by Life Annunities* (1770), and *First Anniversary Sermon after the Declaration of Independence, July 4, 1777*.

GORDONIA, *gawr-dō'nĭ-a*: genus of trees and shrubs of nat. ord. *Ternstroemiaceæ*, having five styles combined into one, which is crowned with five stigmas, a 5-celled capsule, and winged seeds. Several species are natives of America, of which the most important is the LOBLOLLY BAY (*G. Lasianthus*), found in swamps near the sea-coast of the Gulf of Mexico. Moist tracts of considerable extent are often covered with this tree alone. It attains a height of 50 or 60 ft., has oblong, leathery, evergreen leaves, and beautiful white, sweet-scented flowers, more than an inch in diameter. The bark is much used for tanning.

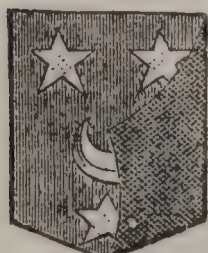
GORDON PASHA: see GORDON, CHARLES GEORGE.

GORDS: see GOURDS.

GORE, n. *gōr* [AS. *gor*, wet filth, blood: Norw. *gor*, wet mud: O.H.G. *horo*, mud, ooze]: thick blood flowing from the body; thick or clotted blood; in *OE.*, dirt or filth. GORY, a. *gō'rĭ*, covered with congealed or clotted blood.

GORE, v. *gōr* [AS. *gar*; Icel. *geirr*, a spear, a javelin]: to pierce or wound with anything pointed, as with the horns of a bull. Go'RING, imp. GORED, pp. *gōrd*: connected with GORE 3.

GORE, n. *gōr* [Dut. *gheere*, the part which makes a garment larger: It. *gherone*, the gusset; Icel. *geiri*, a triangular piece of land; *geirr*, a spear, from the shape of its head]: a corner-shaped piece let into a garment to widen a part: in *heraldry*, a charge consisting of one-third of the shield cut off by two arched lines, one drawn from the dexter or sinister chief, and the other from the bottom of the escutcheon, meeting in the fess point. A Gore Sinister is one of the abatements or marks of dishonor borne for unknighly conduct. See GUSSET. GORE, v. to furnish with gores. See GOAR.



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GORE, *gôr*, CATHERINE GRACE: 1799-1861, Jan. 27; b. East Retford, Nottinghamshire: English novelist. Her father, Mr. Moody, was a wine-merchant in moderate circumstances. In 1823, she was married to Capt. Charles Arthur G. with whom she resided many years on the continent, supporting her family by literary labor. She produced in all 70 works. She died at Lynwood, Hants. Her first published work was *Theresa Marchmont, or the Maid of Honor*, 1823. Some of her early novels, as the *Lettre de Cachet*, and the *Tuileries*, were vivid descriptions of the French revolution; but her greatest successes were her novels of English fashionable life, conspicuous among which were—*Cecil, or the Adventures of a Coxcomb*; and *Cecil, a Peer*; *The Ambassador's Wife*; *The Banker's Wife*, etc. She wrote a prize comedy, *The School for Coquettes*; *Lord Dacre of the South*, a tragedy; *Bond*, a dramatic poem; and some descriptive works.

GORE, *gôr*, CHRISTOPHER, LL.D.: 1758, Sep. 21—1827, Mar. 1; b. Boston: lawyer. He graduated at Harvard College 1776, studied law with Judge Lowell, and began practicing in Boston. He was appointed the first U. S. dist. atty. for Mass. 1789, and held the office till 1796, when he and William Pinckney were appointed commissioners to England to settle the American spoliation claims. On completing this mission he remained in London as charge d'affairs 1803-4, was gov. of Mass. 1809, U. S. senator 1814-17, and presidential elector 1817. His will bequeathed legacies to Harvard College, the Mass. Hist. Soc., and the American Acad. of Sciences. Gore Hall, Harvard's library buildings, was named in his honor, and the college gave him the degree LL.D.

GOREE, *go-râ'*: very small island, belonging to the French, immediately s.e. of Cape Verd, off the w. coast of Africa. It is about three m. in circumference, contains a town defended by a fort, and covering two thirds of the island. G. belonged first to the Dutch, 17th c., was taken by the English 1663; recovered by the Dutch 1664; captured by the French 1677; taken by the English 1758; afterward restored to France; again in English possession 1800-14, except for a few months in 1804; since 1814 a French possession. It is considered by the French as an important commercial entrepôt: its exports are gold dust, ivory, wax, etc. Pop. island about 7,000; town, 3,000.

GOREY, *gôr'ri*: small municipal borough and market-town of Ireland, county of Wexford, about 24 m. n.n.e. of the town of Wexford, and three m. inland from the coast of St. George's Channel. It is an old town, having received its charter of incorporation from James I., and consists mainly of one street of nearly a mile in length. Besides the national school and the savings-bank, there is a Rom. Cath. chapel with nunnery attached, built in the pointed style. G. has considerable trade in agricultural produce. Pop. (1871) 2,639; (1881) 2,450.

GORGE, n. *gôrj* [F. *gorge*, a throat: It. *gorgo*, a gurgle, a whirlpool—from mid. L. *gorgiā*—from L. *gurgēs*, a whirl-

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pool]: the throat; the gullet; that which is swallowed; a narrow passage between hills or mountains: in *fortification*, the rear-opening into any defensive work, consisting of the space between the extremities of the two sides, as between the faces of a ravelin, or between the flanks of a bastion. The demi-gorges of a bastion are lines in continuation of the curtains on each side, extending from the extremities of the flanks to the point of intersection of the lines: see FORTIFICATION. GORGE, v. to swallow greedily; to feed to satiety; to glut: thence, to become choked, as the narrow passage of a river between high banks becoming 'gorged' with ice. GORG'ING, imp. GORGED, pp. *görjd*, glutted: in *heraldry*, applied to an animal (lion, etc.) having a crown as a collar about its neck.

GÖRGEI, *gör'géh-ē*, ARTHUR: general commander-in-chief of the Hungarian army 1848-9: b. 1818, Feb. 5, at Toporecz, county of Szepes (Zips). After a thorough military education, he got a commission as lieut. in the regt. of Palatine Hussars. Finding garrison-life monotonous, and promotion slow, G. became a zealous student of chemistry at Prague. At the outbreak of the revolution, he hastened to the seat of the first independent Hungarian ministry, offering his services, and was sent to Belgium, where he effected a purchase of arms for the new levies of *Houvéd*s. He manifested great military capacity first after the rout of the Hungarian army near Schwechat, when he was made a gen. and conducted with consummate skill and courage, the retreat that had to be effected. His raw levies had to be kept together and drilled under the roaring cannon of the enemy; the disaffected officers, many of them foreigners and addicted to monarchy, to be retained under the revolutionary flag; a commissariat to be organized during fatiguing marches and constant fighting. Perczel's corps was totally dispersed at Moor; government and diet were fleeing toward the Transylvanian frontier, and the dreary wilderness of the Carpathians threatened to become the tomb of all, in the midst of a winter little less severe than that which destroyed the Grand Army of Napoleon I. At the end of 1848, Hungary seemed lost; at the beginning of 1849, Mar., G. was concerting a plan for driving the enemy out of the country. After Dembinski's failure as gen.-in-chief, G. was declared the head of the united army corps of the north (hitherto his own), of the Upper Theiss, under Klapka, and of Szonnok, under Damjanich. 40,000 men, the finest army Hungary ever saw, broke forth from behind the Theiss, and drove the Austrians, with bloody losses, from one position to another. The battles of Hatvan, Bitske, Isaszeg, Gödöllő, Vác, Nagy-Sarlo, were a succession of triumphs. Pesth was evacuated by the enemy, the siege of Komorn was raised, and before April ended, nothing was left in the enemy's hands except a small strip on the w. frontier, and the impregnable fastnesses which surround Tittel on the Lower Theiss. Buda, ancient capital of the realm, well fortified and garrisoned, was to be stormed, and for this the victorious campaign had to be interrupted. The delay was

GORGEOUS—GORGES.

fatal. Russian armies hastened to the rescue of Austria, and regiments of veterans were despatched by Radetzky, the war in Italy being nearly over. The fortress of Buda was carried May 21, but the flower of the Hungarian infantry was buried among its ruins. In the latter part of June, the Austro-Russian army, under Haynau and Panjutine, beat G. near Zsigard; and the affair at Györ (Raab) resulted in the retreat of the Hungarians close to the walls of the fortress of Komorn. July 2, a bloody battle was fought near Szöny, where G. gave proofs of indomitable courage. July 16 a desperate fight took place in and near Vác between Russians and Hungarians. G., after some weeks, arrived in the neighborhood of Arad with an army decimated by continual fighting, by heavy marches, and by dysentery. At Debreczin the corps of Nagy-Sándor was sacrificed to allow an agonizing march of a few days. Aug. 9 the lower army, under Dembinski, was annihilated in the battle of Temesvár, and on the 10th, G. was declared dictator by a council held in the fortress of Arad, under the presidency of Kossuth. But further resistance on the part of the Hungarians had become hopeless, and on the 13th G.'s army surrendered at Világos to Prince Paskievitch, commander-in-chief of the Russian forces. This surrender has often been imputed to G. as treachery. Whether such imputation is permissible, may be judged from the fact, that on the day of surrender G. had 24,000 men with 140 cannon, and that five armies, with more than 200,000 men and 1,000 cannon, were closing upon him from different directions. G. was confined to Klagenfurt, whence he was released on parole, and engaged in chemical studies. In 1852, he published at Leipsic (translation at London in the same year), *Mein Leben und Wirken in Ungarn in den Jahren 1848 und 1849*; and 1869, *Hungary in 1849 and after 1866*.

GORGEOUS, a. gôr'jūs [Norm. F. *gorgias*, or *gourgias*, gaudy, flaunting, proud: connected with F. *gorge*, the throat]: showy; splendid; glittering in a variety of colors. GORGEOUSLY, ad. -lī. GOR'GEOUSNESS, n. -nēs, splendor of raiment; magnificence.

GORGES, gawr'jez. Sir FERDINANDO: about 1565–1647; b. Somersetshire, England: lord-proprietary of Maine. He was a fellow-conspirator with the Earl of Essex, but testified against him when on trial for treason 1601. He served in the royal navy during the war with Spain and was rewarded with the office of gov. of Plymouth 1604. In the following year he became interested in the subject of American colonization, helped organize the Plymouth Company, incorporated 1606, and after promoting several unsuccessful expeditions to the New England coast sent off two vessels which reached the mouth of the Kennebec in Me., where a fortified store-house named Fort George was erected 1607. This colony was abandoned in the following year. Unsuccessful attempts to plant colonies were made 1615, and one party established itself on the Saco in the winter 1616–17. In 1620 he with 39 other patentees, in-

GORGET—GORGON.

cluding 13 peers, formed a corporation and obtained a charter for the 'planting, ruling, ordering, and governing of New England in America.' For his share he united with James Mason in taking the proprietorship of the dist. called Laconia, which was regarded as extending from the Kennebec to the Merrimack. In 1623, his son Robert G. was commissioned lieut. gov. of New England, and the two co-operated in attempting numerous settlements. The corporation surrendered its charter to the king 1635, but G. obtained a new one 1639, in which he was made lord-proprietary of the province of Me., and the office declared to be hereditary in his family. The greater part of his colonization schemes were failures, though Georgiana, which he chartered 1642, became the present town of York, Me. In 1643 a confederacy was formed by all the New England colonies exclusive of G.'s settlements; and these settlements at his death fell to his son John. The new proprietor took little or no interest in the settlements, and after many ineffectual attempts to learn his wishes they formed themselves into a separate administrative body and afterward gave their adhesion to Mass.—G.'s grandson, FERDINANDO G. (1629–1718), sold all his proprietary rights in Me. to Mass. for £1,250 in 1677. He published *America Painted to the Life* (London, 1659).

GORGET, n. gŏr'jĕt [F. *gorgette*—from *gorge*, the throat]: a piece of armor for the throat; small crescent-shaped ornament formerly worn by military officers on the breast; kind of knife, or series of instruments formerly used by surgeons in cutting for the stone: see LITHOTOMY.

GORGIAS, gawr'jĭ-as: celebrated Greek rhetorician, of the time of Socrates; approximately B.C. 483–375; b. at Leontini, Sicily. Little is known of his life. He settled in Greece, residing mostly at Athens, and at Larissa in Thessaly, and died between 105 and 109 years of age. G. has been immortalized by Plato in a dialogue which bears his name. Two works attributed to him are extant, *The Apology of Palamedes* and *Encomiums on Helena*, but their genuineness has been disputed. G. showed little aptitude for theorizing on the art which he professed to teach, and was not remarkable for speculative acumen, but appears to have been a quick and judicious *observer*. He avoided, according to Plato, general definitions of virtue and morality; but Aristotle notices that he had a true appreciation of the facts of morality, as they are manifested in life and character, and the picture given of him by Plato is in harmony with this. He did not wish to be thought a *sophist*, but only a *rhetorician*, and the ancients were in fact at a loss whether to consider him the latter or both. In philosophy, he held: (1) There is nothing that has any real existence; (2) Even if anything really exists, it cannot be known; (3) Even if real existence is knowledge, the knowledge is incommunicable. In nat. philos. he seems to have agreed with Empedocles. See monograph by Foss (1828), *De Gorgia Leontino Commentatio*.

GORGON, n. gŏr'gŏn [Gr. and L. *gorgon*, a Gorgon—

GORGONIA.

from Gr. *gorgos*, fierce: comp. Gael. *gorg*, fierce]: anything very horrid or ugly. In Gr. *myth.*, according to Homer, a frightful monster inhabiting the infernal regions, the head of which was peculiarly appalling. Homer and Euripides make mention of only one G., the daughter of Terra, who was slain by Minerva; while Hesiod mentions three Gorgons—Stheno, Euryale, and Medusa, daughters of Phorcys and Ceto, called likewise the Phorcidæ. Their habitation, according to the same author, was in the Western Ocean, in the neighborhood of Night and the Hesperides; while Herodotus and other later writers place it in Libya. They are represented as girded with serpents with heads erect, vibrating their tongues, and gnashing their teeth. Æschylus describes them as winged virgins with brazen claws, and enormous teeth, having two serpents round their bodies by way of girdle. The name G. was given especially to Medusa. According to later legends, Medusa was originally a very beautiful maiden, and the only one of the three sisters who was mortal. But she having become a mother by Neptune in one of Minerva's temples, that virgin goddess was so affronted that she changed Medusa's hair into serpents, giving her so fearful an appearance that whoever looked on her was turned into stone. Medusa was killed by Perseus (q. v.), and her head was afterward placed in the shield of Minerva. Various explanations have been given of the myth by the ancients and the moderns, but none satisfactory.—Compare Levezow, *Ueber die Entwicklung des Gorgonenideals in der Poesie und bildenden Kunst der Alten* (Berlin 1833). GORGO'NEAN, or GORGO'NIAN, a. -gō'nī-an, like or pertaining to a Gorgon; very ugly or terrific. GORGONEIA, n. gōr'gō-nē-yā, masks carved in imitation of the Gorgons' heads, used as key-stones in arches; sing. GOR'GONEI'ON, -nēyōn.



Gorgonia (*Gorgonia flabellum*).

GORGONIA, gawr-gō'nī-a, [named from their branching

GORHAM—GORHAM CONTROVERSY.

flexible stems]: genus of zoophytes (*Anthozoa*), allied to *Alcyonium* (q.v.). The whole structure (polype-mass) is rooted and branching, consisting of a horny central axis with a polypiferous flesh, which when dried becomes a friable crust full of calcareous spicules. The hard stem is composed of concentric layers, probably formed in succession by consolidation of the fleshy substance. The stem is usually brown or black, while the flesh, or even the dried crust, often has colors of great brilliancy. The polypes have eight tentacles. The species most generally known is *G. flabellum*, or *Flabellum Veneris*, called also the Sea-fan, or Venus's Fan, a tropical species, often brought as a curiosity from the W. Indies, a striking and characteristic specimen of this genus, and of the family *Gorgoniadæ*.

GORHAM, *gôr'ham*: village of G. township, Coos co., N. H., on the Androscoggin river and the Grand Trunk railroad: 91 m. n.w. of Portland, Me. It is the n. gate to the White Mountains, and is 10 m. n.e. of Mount Washington; has numerous hotels for tourists and summer guests, 3 churches, a savings bank, and a weekly newspaper. Pop. (1880) 1,360; (1890) 1,710; (1900) 1,797.

GORHAM, NATHANIEL: 1738, May 27—1796, June 11; b. Charlestown, Mass.: statesman. He received a common-school education, engaged in mercantile business, and became active in public affairs early in the revolutionary period. He was a member of the legislature 1771-75, delegate to the provincial congress 1774-5, member of the committee on war 1778-81, delegate to the continental congress 1782-3, 1785-87 and pres. of it 1786, and was pres. three months of the convention that framed the Federal constitution, and judge of the Mass. court of common pleas several years.

GORHAM CONTROVERSY: controversy in the Church of England, arising from the refusal of Dr. Philpott, Bp. of Exeter, to institute the Rev. Cornelius Gorham, formerly fellow of Queen's College, Cambridge, and then vicar of St. Just-in-Penrith, to the vicarage of Brampford Speke, on his presentation thereto by the lord chancellor. The alleged ground of this refusal was, that after examination the bishop found Mr. Gorham unsound in doctrine as to the efficacy of the 'Sacrament' of Baptism, inasmuch as he held that spiritual regeneration is not given or conferred in that rite, and in particular, that infants are not made therein 'members of Christ and the children of God,' as the catechisms and formularies of the church declare them to be. The case was brought before the arches court of Canterbury, which decided (1849) that baptismal regeneration is the doctrine of the Church of England and that Mr. Gorham maintained doctrines on that point opposed to those of the church; that consequently the bishop had shown sufficient cause for his refusal to institute, and that the appeal must be dismissed with costs. From this decision, Mr. Gorham appealed to the judicial committee of privy council. That committee complained that the bishop's questions were intricate and entangling, and that the answers were not

GORICA.

given plainly and directly. Their decision was in substance as follows: and it must be noted what points they undertook to decide, and what they left. The court declared that it had no jurisdiction to settle matters of faith, or to determine what ought, in any particular, to be the doctrine of the Church of England, its duty being only to consider what is by law established to be her doctrine on the legal construction of her articles and formularies. It appeared that very different opinions as to baptism were held by the promoters of the reformation; that differences of opinion on various points left open were always thought consistent with subscription to the articles; also, that opinions in no important particular distinguished from Mr. Gorham's had been maintained without censure by many eminent prelates and divines. Without expressing any opinion as to the theological accuracy of Mr. Gorham's opinions, the court decided that the judgment of the arches court should be reversed. Mr. Gorham was accordingly instituted to Brampford Speke. During the two years that the suit was pending, the theological question was discussed with various degrees of ability and acrimony in sermons and pamphlets; and it was expected that if the judgment had gone the other way, a large body of the evangelical clergy, many of whom hold views more or less in accordance with those of Mr. Gorham, would have seceded from the church.

GORICA, *gōr'ī-kā*: Austrian town in Croatia, 10 m. s.s.e. of Agram. Pop. 8,000.

GORILLA.

GORILLA, n. *gō-rīl'li* [an African word: said by Latham to be found in a Gr. translation of an anc. Carthaginian work in the plural *gorillai*], (*Troglodytes Gorilla*): a great African ape, of about the size of man; referred by naturalists generally to the same genus with the chimpanzee, though Prof. Isidore Geoffroy St. Hilaire has attempted to establish for it a separate genus. It has its name from the supposition that it is the same animal mentioned in the *Periplus* of Hanno, Carthaginian navigator, who visited the tropical parts of the w. coast of Africa about B.C. 350, though it is far from certain that the G. of Hanno is not the chimpanzee. Vague accounts of apes of great size, and of which wonderful stories were told, were from time to time brought from w. Africa; but it was not till 1847 that the G. became really known to naturalists, when a skull was sent to Dr. Savage, of Boston, by Dr. Wilson, American missionary on the Gaboon river. Since that time, not only have skeletons and skins been obtained in sufficient number for scientific examination, but information has been procured concerning the habits of the animal in its native

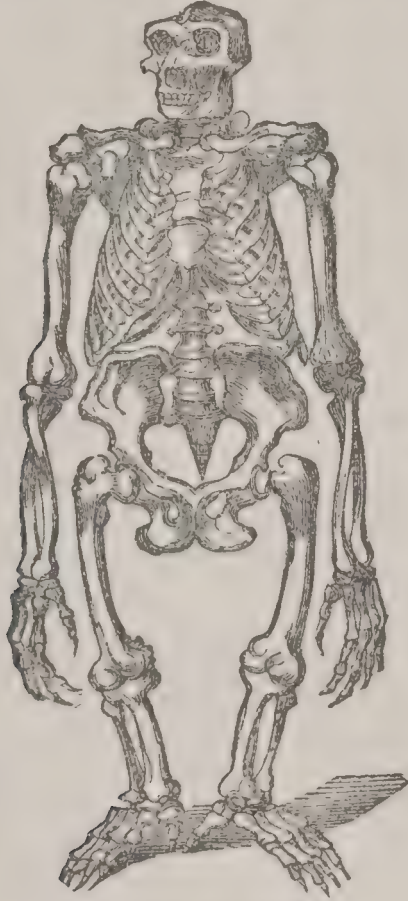


Gorilla.

haunts. The accounts of the G. in Du Chailla's *Explorations and Adventures in Equatorial Africa* (Lond. 1861) are regarded by the highest scientific authorities, particularly by Owen, as in the main trustworthy, notwithstanding all the doubt that was at first cast over that traveller's narrative, and there is little doubt that they accord with all that we have learned from other sources, and with inferences from the dentition and osteology of the animal.

GORILLA.

The G. differs from the chimpanzee in its greater size; the height of an adult male in erect posture being commonly about five ft. six inches or five ft. eight inches, though there is reason to think that it sometimes exceeds six ft. Its strength appears greater in proportion to its size, and even its skeleton indicates very great muscular power in jaws and limbs. The bony ridges in the skull above the



Skeleton of Gorilla.

eyes are extremely prominent, and the skull of the male exhibits also a large occipital ridge on the top of the head. The brain is small. The nasal bones project more than in the chimpanzee, thus producing an approximation to the human face, in a somewhat prominent nose. The lower part of the face, however, projects excessively; moreover, the teeth do not form a perfectly uninterrupted series as in man, and the canine teeth are very large, particularly in the male, projecting considerably more than an inch from the upper jaw—much larger in proportion than in the chimpanzee; though, on the other hand, the molars bear a greater proportion to the incisors, and thus approach more to the human character. The breadth at the shoulders is great. There are 13 pairs of ribs. The pelvis approaches the human form more than in any other ape. The arms are not so long as in the chimpanzee, but reach nearly to the knee in the erect position. The lower limbs, though shorter in proportion than in man, are longer than in the chimpanzee. The foot is less turned inward than in the chimpanzee, and is better fitted for walking on the ground; the great toe is a true thumb, as in the chimpanzee, standing

GORITZ—GORKHA.

out from the foot at an angle of about 60° , and is remarkably large and strong. The hands or paws of the fore limbs also are remarkable for great size, thickness, and strength. The fingers are short, but the circumference of the middle finger at the first joint is sometimes more than six inches. — The G. has a black skin, covered with short dark-gray hair, reddish brown on the head; the hair on the arms longer, that on the arm from the shoulder to the elbow pointing downward, and that on the fore-arm pointing upward to the elbow, where a tuft is formed. The face is covered with hair, but the chest is bare. There is scarcely any appearance of neck. The mouth is wide, and no red appears on the lips. The eyes are deeply sunk beneath the projecting ridge of the skull, giving to the countenance a savage scowl, the aspect of ferocity being aggravated by frequent exhibition of the teeth. The belly is very large and prominent; in accordance with which character, the G. is represented as a most voracious feeder, its food being exclusively vegetable—obtained partly by climbing trees, and partly on the ground. It is very fond of fruits and of some leaves, as the fleshy parts of the leaves of the pineapple; and employs its great strength of jaws and teeth in tearing vegetable substances and cracking nuts which would require a heavy blow of a hammer. It is not gregarious in its habits. It spends most of its time on the ground, though often climbing trees. It is capable of defending itself against almost any beast of prey. It has a kind of barking voice, varying when it is enraged to a terrific roar. It inhabits exclusively the densest parts of tropical forests, and is found only in regions where fresh water is abundant. It is much dreaded by the people of the countries which it inhabits, though by some of the tribes its flesh is sought as food. Many strange stories are current among them about its habits, which seem entitled to little regard—e.g., its carrying away men and women, and detaining them for some time in the woods—its lying in wait on the branch of a tree till a man passes beneath, furtively stretching down one of its hinder legs to catch him, and holding him in the grasp of its foot, or rather hand, till he is strangled; and the like.—The G. has not been hitherto tamed, and in an adult state at least, seems incapable of it. In 1876, a live G. was brought to Berlin, the first authentic instance of the introduction of the animal into Europe. The name given to this animal in its native country is *Ngina*, or *Ingeena*: see CHIMPANZEE: MONKEY: ETC.

Hartmann (in *Anthropoid Apes*) disputes Du Chaillu's assertion that there are two other species of *Troglodytes*, Nschiego-Mbouvé and Koolo-kamba; the former is certainly a chimpanzee. Probably the distinction drawn by some between *G. gina* and *G. manyema* is only between varieties of the one species.

GO RITZ see GÖRTZ.

GORKHA, *gor'kâ*: town of Nepaul, lat. $27^\circ 52'$ n., and in long $84^\circ 28'$ e.; 53 m. w. of Khatmandu, cap. of the state. Originally the seat of the reigning dynasty of the



Hand (a) and Foot (b) of Gorilla.



The Great Gourd (*Cucurbita maxima*): Branch with Flower.



The Great Gourd (*Cucurbita maxima*): Fruit.

GORKUM—GORMAND.

country, it gives name to the dominant race—a race noted for fidelity to the English, and for valor during the mutiny of 1857.

GORKUM, *gör'kü'm* (Dutch *Gorinchem*): town and fortress in the Netherlands province of s. Holland, on the Merwede, where it is joined by the Linge, 22 m. e.s.e. of Rotterdam. It is well built, has a town-house, military establishments, and trade in agricultural produce and fish, especially salmon. Ship-building, making leather ropes, beer, book-printing, etc., are chief industries. Pop. (1880) 9,797; (1890) 11,900.

GÖRLITZ, *gör'lits*: fortified town of Prussia, province of Silesia, a principal station on the railway from Dresden to Breslau; on a declivity on the left bank of the Neisse, 52 m. w. of Liegnitz. It is well built, surrounded by old walls, and flanked with towers, the chief of which is Kaisertrutz, now the guard-house and armory of the town. Among the many beautiful Gothic churches, the most interesting is that of St. Peter and St. Paul, built 1423-97, and having five naves, a magnificent organ, and a bell 12½ tons in weight. In the n.w. of the town is the Kreuzkappelle (Chapel of the Cross), an imitation of the Holy Sepulchre at Jerusalem. G. has also a gymnasium with an excellent library, numerous educational and benevolent institutions, and a theatre. A viaduct more than 1,500 ft. in length, and 115 ft. high, one of the grandest in n. Germany, here crosses the valley of Neisse. Pop. (1880) 50,307; (1900) 80,931.

GÖRLITZ PROCESS: celebrated trial in Germany, 1850. 1847, June 13, the Countess of Görlitz was strangled by one of her servants, Johann Stauff, whom she had caught stealing valuables from an open desk in her sitting-room, and her corpse was found a few hours afterward burned by a combustible stuff heaped upon her. After more than two years spent in preliminary investigation, the case was tried before the assizes at Darmstadt, 1850, Mar. 11, and occupied a whole month. The murderer, who obstinately denied having committed the crime imputed to him, was condemned to imprisonment for life. The scientific interest of the case arose from its having led to a discussion on the possibility of the spontaneous combustion of the human body.

GORMAN. ARTHUR PUE: an American legislator; b. 1839, Mar. 11; was a page in the U. S. Senate, 1852-66. In the latter year he was made collector of internal revenue for the 5th district of Maryland. In 1872 he became president of the Chesapeake and Ohio Canal Co.; was elected a U. S. Senator from Maryland, 1881, and re-elected, 1887, 1893 and 1902. The Democrats made him their leader in the U. S. Senate, 1903.

GORMAND, n. *gör'mänd*, or **GOURMAND**, n. *gôr'mänd* [*F. gourmand*, a glutton—from prov. *F. gourmer*, to taste wine: *OF. gormand*, belly-god]: a greedy or ravenous eater; a glutton; one who studies good living. **GOR'MANDIZE**, v. *-dîz*, to eat greedily. **GOR'MANDIZING**, imp.: **ADJ. glut-**

GORO—GÖRRES.

tonous: N. gluttonous habits. **GOR'MANDIZED**, pp. *-dīzēd*. **GOR'MANDIZER**, n. *-zēr*, one who eats much and greedily. **GOR'MANDISM**, n. *-dīzm*, gluttony.—**SYN.** of 'gormand:': epicure; voluptuary; sensualist.

GO'RO: see **GOROZA**.

GOROZO, **GORO SABURO**: name of a family in Kioto, Japan, famous for 9 generations as metal-workers and especially for their exquisite art productions in the various forms of bronze. Japanese artisans seem to possess a method of forming amalgams, and of overlaying one metal on another unknown elsewhere, and the *cloisonné*, *champlevé*, and *repoussé* works of the G. family, stamped with the family name *Goro*, and that of its living head, are known and highly prized the world over.

GÖRRES, *gör'ēs*, **JAKOB JOSEPH VON**: 1776, Jan. 25—1848, Jan. 27; b. Coblenz: German author. In common with most of the ardent youth of the time, G. threw himself eagerly into the movement of the French Revolution; became an active member of the clubs and debating societies which sprang up in all the towns on the French border, and established a newspaper, the *Red Journal*, exponent of extreme opinions. In 1799, he went to Paris as chief of a deputation to negotiate the annexation of the Rhineland to the French republic, but the revolution of the 18th Brumaire put an end to this and all similar dreams. G. returned to Germany, disgusted with politics, quietly settled down in a professorship in his native town, and applied himself to literature for several years. His works on art, on physiology, on the laws of organism, and on the relations of faith and science, attracted much attention. In 1806. he published the first part of his well-known collection of *German Popular Legends*; and 1806, his work on the mythology of the Asiatic nations, and a further contribution to the legendary literature of Germany. From these studies he was aroused to the hope of liberation from French tyranny, by the reverses of the French arms in the Russian expedition. G. was not slow to appeal to the national sentiment of his countrymen in the *Rhenish Mercury*, one of the most spirit-stirring journals which Germany had ever possessed; he became, in truth, the literary centre of the national movement. After the re-establishment of German independence, G. continued the career of a journalist, and withstood the encroachments of domestic absolutism with the same energy with which he had denounced the tyranny of foreign occupation; until having drawn the displeasure of the government, he fled to France, and afterward to Switzerland. In 1827, he gladly accepted the professorship of the history of literature in the new Univ. at Munich. His later years were given to literature, and in part to the animated religious controversies occasioned in Germany by the contests between the Abp. of Cologne and the Prussian govt. on mixed marriages and Hermesianism: see **HERMES**. G. was an ardent Rom. Catholic, and was, if not the originator, at least the main supporter of the Rom. Cath. journal,

GORRINGE—GORTSCHAKOFF.

Historisch-Politische Blätter. The liberals of these days, however, claiming G. as of their company, deny that he ever insisted on the supremacy of Rome.

GORRINGE, HENRY H.: an American naval officer; 1841, Aug. 11—1885, July 6; entered the U. S. Navy 1862. He is principally known by his removal from Egypt to New York of the Egyptian obelisk (Cleopatra's Needle), which was a gift to the United States from the Khedive. The obelisk reached New York, 1880, July 20, and was erected in Central Park, 1881, Jan. 23. G. wrote *A History of Egyptian Obelisks*.

GORSE, n. *gōrs* [W. *gores*, or *gorest*, waste, open]: a prickly shrub bearing yellow flowers; whin or furze; the *Ulex europæus*, ord. *Leguminosæ*. GORSY, a. *gōr'si*, abounding in or resembling gorse.

GOR TON, SAMUEL: about 1600–1677; b. Gorton, England, founder of sect of 'Nothingarians.' He received a meagre education, was apprenticed to a clothier, became very religious, and emigrated to Boston 1636 to escape ridicule for his peculiar opinions. He had been there but a short time when he was expelled from the colony for heresy. Being permitted to settle in Plymouth his religious opinions led to his being arrested, imprisoned, fined, and again expelled 1637–8. He then took refuge in Aquidneck now Newport, R. I., where he was publicly whipped for speaking contemptuously of the magistrates, and fled to Pawtuxet, where he became involved in disputes with the colonists over land purchases. The authorities summoned him to Boston for trial, but instead he removed to Shawomet and bought land of the Indians. In 1643 some Indians believing that they had been defrauded by him applied to the gen. court at Boston for redress, and 40 soldiers were sent thither and took him and 10 of his followers prisoners. They were tried as heretics and sentenced to hard labor in irons, but were released and ordered to leave the colony 1644, Oct. He then returned to Shawomet, renamed his colony Warwick, and became a preacher, magistrate, and founder of the sect of 'Nothingarians,' so named because they repudiated every kind of religious forms and recognized no ministry. He published *Simplicitie's Defense against Seven-Headed Policy* (London, 1646); *An Incorruptible Key composed of the CX. Psalm* (1647); *Saltmarsh returned from the Dead* (1655); *An Antidote against the Common Plague of the World* (1657); and *Certain Copies of Letters*. Gov. Winslow published *Narrative of Disturbances made in New England by Samuel Gorton and his Accomplices* (1649).

GORTSCHAKOFF, *gawrt-chû-kof*, or GORCHAKOV: Russian family; tracing its ancestry through St. Michael of Tschernigoff (b. 1246) to Rurik and Vladimir the Great.—Prince PETER G., gov. of Smolensk, defended that town two years, 1609–11, against Sigismund of Poland, who at last took it by storm.—Prince DIMITRI G. (1756–1824) was a celebrated Russian poet, and wrote odes, satires, and epistles.—Prince ALEXANDER G. (1764–1825) served under his uncle Suwaroff in Turkey and Poland, showed great courage at the capture of Praga (suburb of Warsaw), and was

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made lieut.gen. 1798. In the campaign of 1799 he commanded under Korsakoff at Zürich, was subsequently made military gov. of Viborg, repulsed Marshal Lannes at Heilsburg, and commanded the right wing at the battle of Friedland. He was minister of war from 1812 to the end of the war, when he was made gen. of infantry, and member of the imperial council.—Prince ANDREAS G. served 1799 as maj.gen. under Suwaroff in Italy; and commanded a division of grenadiers in Borodino 1812, where he was wounded. In the campaign of 1813-14, he commanded the 1st corps of Russian infantry, and distinguished himself at Leipsic and Paris. He was made gen. of infantry 1819, and 1828 retired from active service.—Prince PETER DIMITRIEVICH G. (1790-1868) was in the campaigns of 1813-14; and served in Caucasia under Gen. Yermoloff. As chief of the general staff of Wittgenstein 1826, he was one of the signers of the treaty of Adrianople. In 1839, he was appointed gov.gen. of Eastern Siberia, and occupied that important post until, 1851, he retired from active life. On the outbreak of the Crimean war, however, he offered his services, and at the battle of the Alma he commanded the left wing of the Russians; he was also in the battle of Inkermann.

GORTSCHAKOFF' (or GORCHAKOV), Prince ALEXANDER MIKHAIL: Russian diplomatist: 1798-1883, Mar. 11; brother of Prince Peter Dimitrievich G. He was sec. of the Russian embassy in London 1824, was sent to Florence 1830, Vienna 1832, and Stuttgart 1841. In 1854 he represented Russia in the Vienna conferences; and 1856 he became minister of foreign affairs. In 1870, he issued his circular setting aside the treaty of 1856, and leading to the London Conference 1871. He was the guiding spirit of Russian policy during the critical period 1877-79, and was one of the most prominent members of the Berlin Congress 1878. After 1863, at which time he was the most powerful minister in Europe, he was honored with the title of chancellor of the empire. He retired from the ministry of foreign affairs 1881.

GORTSCHAKOFF' (or GORCHAKOV), Prince MIKHAIL DIMITRIEVICH: 1792-1861, May 30; brother of Prince Peter Dimitrievich G. He began his military career as an officer of artillery, and directed operations 1828 at the sieges of Silistria and Schumla. Chief of the staff of Count Pahlen 1831, he gave proofs of extraordinary valor in the battle of Ostrolenka and at the taking of Warsaw. He was wounded at Grohow, and made gen.; succeeded Count Toll as chief of the staff of the whole army. was appointed gen. of artillery 1843, and military gov. of Warsaw 1846. In 1853, he commanded the Russian forces numbering abt. 60,000 in the Danubian provinces, crossed the Danube, at Braila, 1854, Mar. 23, occupied the frontiers of Bessarabia, and 1855, Mar., as Russian commander-in-chief in the Crimea; directed the defenses of Sebastopol, attacked by the armies of Great Britain and France. As a reward for his services in this unsuccessful but brilliant defense, Prince G. was ap-

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pointed by Emperor Alexander II. lieut.gen. of the kingdom of Poland, and was for several years a wise and conciliatory representative of his youthful emperor at Warsaw.

GORTYNA, *gawr-ti'na*, or **GORTYN**, *gawr'tin*: ancient, and next to Cuossus the largest and most powerful, city of Crete, on a plain bordering on the Lethæus river, 90 stadia from the Libyan sea, where it had two harbors, Metallum and Lebena. It contained temples of Apollo, Pythius, Artemis, and Zeus, and in its immediate neighborhood were the famous fountain of Sauros, inclosed by fruit-bearing poplars, and the spring in the shadow of an evergreen plane-tree where Jupiter and Europa were believed to have met for love-making. There are numerous caves in the vicinity, which some authorities claim to be the original labyrinth of Minos. G. and Cuossus united in conquering the rest of the island, and then quarrelled over the distribution. Hagii Dekka is said to exhibit ruins of G.

GORUCKPO'RE: see **GORAKHPUR**.

GORY, a.: see **GORE** 1.

GORY DEW: dark red slimy film frequently seen on damp walls and in shady places; often on the whitewashed walls of damp cellars, where its appearance sometimes has startling resemblance to blood. It is one of the lowest forms of vegetable life, one of the *algæ* of the group *Palmellaceæ* (included in *Confervaceæ*), and nearly allied to the plant to which the phenomenon of **RED SNOW** (q.v.) appears chiefly due. Its botanical name is *Palmella cruenta*. It sometimes extends over a considerable surface, and becomes a tough gelatinous mass. For the structure and mode of growth of this and allied plants, see **PALMELLACEÆ**. Its characteristic red color appears also in *Hæmatococcus sanguineus*, a nearly allied plant, found in similar situations, but which seems to extend more as an aggregation of cells, not soon melting down into an indefinite slime like the cells of the *Palmella*. The prevalent color of the group, however, is green.

GÖRZ, or **GÖRITZ**: with **GRADISKA**, *grâ-dēs'kâ*, one of the crown-lands of the Austrian monarchy: see **KUSTENLAND**.

GÖRZ, *görts*, or **GÖRITZ**, *gö'rīts*: important town of Austria, in the crown-land of the Kustenland (Coast Districts), cap. of the dist. of G.; charmingly situated in a fruitful plain on the left bank of the Isonzo, about 25 m. n.n.w. from Trieste. Among its principal buildings are the old castle of the former Counts of G., now used as a prison; and the cathedral, with a beautiful *sacrarium*. G. has extensive sugar-refining, and manufactures of rosoglio, silks, linen, cotton, and leather: it has also a thriving trade in its manufactures and in dried fruits. Pop. (1890) 17,956.

GOSCHEN, *go'shên*, **GEORGE JOACHIM**: statesman: b. London, England, 1831, Aug. 10. He was educated at Rugby and Oriel College, Oxford, and was engaged in mercantile business 1853-63. He was elected M.P. for London as a liberal 1863, re-elected 1865, made vice-pres. of the board

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of trade and privy-councilor 1865, Nov., and chancellor of the Duchy of Lancaster and a cabinet-minister 1866, Jan., and retired with the Russell ministry. On the accession of Mr. Gladstone, 1868, Dec., he was appointed pres. of the poor-law board, and, 1871, Mar., first lord of the admiralty, retiring on the defeat of his party 1874. In 1876 he was chosen delegate of the British holders of Egyptian bonds to effect a conversion of the debts and bonds; 1878 was British delegate to the international monetary conference in Paris; 1880, on Mr. Gladstone's return to power, was appointed ambassador extraordinary at Constantinople to aid in forcing Turkey and Greece to execute the unperformed parts of the treaty of Berlin; 1882 appointed an ecclesiastical commissioner for England; 1885, elected M.P. for the e. division of Edinburgh; 1886 defeated by a large Gladstone-liberal majority; and 1887, Jan. 14, became chancellor of the exchequer of Great Britain and Ireland in Lord Salisbury's cabinet. He was a hearty supporter and confidential friend of Mr. Gladstone till the latter introduced his famous Home-rule Bill 1886, when G. opposed both friend and measure with great vigor. He has published several works on financial and economic topics.

GOSHAWK, n. *gōs'hawk* [AS. *gos-hafoc*—from *gós*, a goose; *hafoc*, a hawk: Icel. *gás-haukr*], (*Astur*): genus of *Falconidæ* (q.v.), distinguished from the true falcons by a lobe or festoon, instead of a sharp tooth, on the edge of the



Goshawk (*Astur palumbarius*)
(Copied from *Falconry in the British Isles*).

upper mandible, and by the shortness of the wing, which reaches only to the middle of the tail. It is more nearly allied to the sparrow-hawks, from which it is distinguished by its more robust form, by its shorter legs, and by the middle toe not being elongated, as in that genus. The species to

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which the name G. originally and strictly belongs (*A. palumbarius*), is very widely diffused over Europe, Asia, n. Africa, and N. America, chiefly in hilly and wooded regions. It is now very rare in Britain. Although one of those that were called *ignoble* birds of prey, it was much used for falconry, being easily trained, and very successful in catching such game as is either confined to the ground, or does not rise far from it, or such as is to be found in woods, through the branches of which the G. readily threads its way in pursuit. The G. was thus flown at hares, rabbits, pheasants, partridges, etc. It ordinarily seeks its prey by flying near the ground, and can remain a very long time on the wing. It follows its prey in a straight line, not rising in the air to descend upon it, like the falcons; and when baffled by the object of pursuit entering a wood and hiding itself in some covert, will perch on a bough, and await its reappearance with wonderful patience for many hours. Its flight is very rapid. The G. builds in trees. Its nest is very large. The female, which is much larger than the male, is about two ft. in entire length. Both sexes are of dark grayish-brown color, the upper surface of the tail-feathers barred with darker-brown; there is a broad white streak above each eye; the under parts also are whitish, with brown bars and streaks.—Other species are found in India, s. Africa, Australia, etc.

GOSHEN, *gō'shēn*: that part of ancient Egypt which Pharaoh gave to the kindred of Joseph when they came to sojourn in that country. It appears to have been between the e. delta of the Nile and the frontier of Palestine, and to have been suited mainly for a pastoral people, which the Hebrews were. Rameses, the principal city of the land, was the starting-point of the Exodus of the chosen people who reached the Red Sea in three days. From this and other circumstances, it has been concluded that the *Wāde-t-Tumeylāt* (the valley through which formerly passed the canal of the Red Sea, and at the w. extremity of which Rameses was situated) is probably the G. of the Old Testament.—Another land and city of G. in southern Palestine are mentioned in the Old Testament.

GOSHEN, *gō'shēn*: city, cap. of Elkhart co., Ind.; 60 m. n. of Indianapolis, 64 m. n.w. of Fort Wayne, 110 m. e. of Chicago; on Elkhart river and the Cincinnati, Wabash and Michigan, and the air-line div. of the Lake Shore and Michigan Southern railroads. It contains a co. court-house, 10 churches, 1 high and 3 graded schools, 1 national bank (cap. \$77,000), and 2 private banks, handsome residences and wide streets, and 3 weekly newspapers. Its industries comprise woolen, and oil mills, machine-shops, agricultural implement works, and several furniture factories and saw-mills. It has an annual lumber trade of over 5,000,000 ft. Pop. (1880) 4,123; (1900) 9,152.

GO'SHEN: city, one of the caps. of Orange co., N. Y.: 18 m. s.w. of Newburg, 60 m. n.w. of New York; on New York Lake Erie and Western railroad. It contains a court-house, 7 churches, 2 nat. banks (cap. \$165,000),

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1 savings-bank, female seminary, several classical schools, and 2 weekly newspapers. Its industries comprise the manufacture of butter, cheese, bricks, and tiles, and its chief trade is in butter, milk, and cheese, which are exported in large quantities. It was settled 1772, incor. 1809. Pop. (1870) 2,205; (1880) 2,557; (1900) 2,826.

GOSHENITE, n. *gō'shēn-īt* [from *Goshen*, Mass., where it occurs]: variety of beryl.

GOSLAR, *gōs'lār*: small but ancient and interesting town of Hanover, on the border of Brunswick, on the Gose, from which the town derives its name, 26 m. s.e. of Hildesheim. It was formerly a free imperial city, and the residence of the emperor. Of all its ancient fortifications, the walls and one tower—the Zwinger, the walls 21 ft. thick—are all that remain. Of the venerable cathedral, the porch (date 1150) is the sole relic; the remaining portion of the old imperial palace has been lately restored; the Gothic church in the market-place dates from 1521; the hotel the *Kaisertorth* has eight portraits of German emperors. G. was founded by Heinrich I about 920; and under Otto I. the mines, for which G. has ever since been celebrated, were opened in 986. The mines of gold, silver, copper, lead, and zinc are, however, nearly exhausted. Pop. (1880) 10,791; (1890) 13,311; (1895) 18,966.

GOSLARITE, n. *gōs'lār-īt* [*Goslar* in the Harz Mountains]: a mineral, a native sulphate of zinc.

GOSLING, n. *gōz'ling* [ÅS. *gos*, a goose, and *ling*, dim. termination]: a young goose; a catkin on nut-trees and pines.

GOSNOLD, *gos'nold*, BARTHOLOMEW: d. 1607, Aug. 22; b. England: navigator. He was associated with Sir Walter Raleigh in his unsuccessful attempt to establish an English colony in Va., and in 1602 returned to America with a party of colonists, sailing more directly across the Atlantic instead of on the s. course of previous navigators, and coming to anchor in York harbor, Me., May 14. On the following day he sailed for a more suitable place of settlement, entered Mass. Bay, named the great promontory Cape Cod, and with four of his men went ashore there. Afterward he sailed around the cape, discovered the island No Man's Land, and planted his colony on an island at the mouth of Buzzard's Bay which he named Elizabeth in honor of his queen, but which is best known by the Indian name Cuttyhunk. His people became discouraged within a few months and returned to England. In 1606 he obtained a charter from James I., the first under which an English colony was established in America, and sailing with three vessels and 105 people entered a river in Va., which he named after the king, and founded Jamestown, 50 m. from its mouth, early in 1607. The site was unhealthy, and G. with 50 of his people died before autumn.

GOSPEL—GOSPELS.

GOSPEL, *n.* *gös'pěl* [AS. *god-spell*; Icel. *guds-spial*, God-story, the word of God—from AS. *god*, Icel. *guds*, God, and AS. *spell*, Icel. *spiall*, word, discourse, tidings; Goth. *spillon*, to tell—see Skeat]: *literally*, words from God; the narrative of God—i.e., the life of Christ; one of the four histories of Christ handed down to us by the inspired writers, Matthew, Mark, Luke, and John; the whole system of the Christian faith; God's word; general doctrines of the New Test. **GOSPELER**, or **GOSPELLER**, *n.* *-lér*, he who reads the Gospel at the altar (also, see **GOSPELERS** below). **GOSPEL TRUTH**, the doctrines or truths of the New Test.; certain truth. **GOSPEL SIDE OF THE ALTAR**, the right side of the altar or communion table, looking *from* it, at which side, in the English Church service, the gospel appointed for the day is read. It is of higher distinction than the epistle side, and is occupied by the clergyman of highest ecclesiastical rank who happens to be present. In some cathedrals, one of the clergy has this special duty to perform, and is designated the Gospeler.

GOSPELERS, *gös'pəl-ərz*: term of derision applied by Roman Catholics in England to Wickliffe and his followers after he had translated the New Test. into English; and afterward to all who engaged in circulating the scriptures in any but the Greek, Hebrew, and Latin languages, and reading and explaining them in the language of the people.—G. had a different application at the time of the Reformation, being used to describe a class of Antinomians who preached against the doctrine of predestination taught by the reformers, and led many to become lax in the conduct of their lives. Melancthon wrote strongly against their views, Calvin warned the people not to be misled by theories on this subject, since God's decrees were secrets which men could not penetrate, and Hooper and other writers exhorted the people against entering into 'these curiosities.'

GOSPELS: the four historical records of the Lord Jesus Christ, handed down to us from the evangelists, Matthew, Mark, Luke, and John who wrote as apostles, eye-witnesses of Christ and his work, or as recording the testimony of his apostles. From the apostolic age, these four writings have been held by the church as inspired by the Holy Spirit, and therefore authoritative. The word G. though not a translation from the Gr. *euangelion* (good tidings), is its English equivalent. When this name was first applied to these records, is uncertain. The use of it in Justin Martyr, 2d c., is a subject of dispute. It appears to have been in common use in the 3 c.

1. *Genuineness*.—The primary and most interesting inquiry concerning the G. is as to their genuineness. They profess to be faithful records of the Lord's life—of his sayings and doings—proceeding in two cases from men who were his apostles and companions (Matthew and John); and in the two other cases (Luke and John), from men who, though not themselves apostles, were apostolic in their position and character, the immediate compan-

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ions and fellow-laborers of the apostles. According to their profession, they all were composed during the latter half of the 1st c.; the three *Synoptic* Gospels, as the first three are called, probably during the decade preceding the destruction of Jerusalem by Titus (A.D. 60-70), and the fourth Gospel (John) near the close of the century. The question as to their genuineness is in the main the question as to the fact of their existence at this early period; the special authorship of each Gospel is a comparatively less important question.

It is obvious that the existence of the G. within the 1st c. is a point which can be settled only by the ordinary rules of historical evidence. What traces have we of their existence at this early period? As Paley illustrates the matter, we can tell of the existence of Lord Clarendon's *History of the Rebellion* at a period antecedent to Bishop Burnet's *History of his own Times*, by the fact that Burnet quotes Clarendon. If the G. existed in the 1st c., therefore, we shall expect to find similar evidences of their existence in the Christian writings of the 2d and 3d c.. We find such evidence in abundance during the 3d c. In such writers as Origen and Cyprian, are not only quotations from the G., but the G. themselves are mentioned by name as books of authority among Christians. From the writings of Origen alone, if all had survived, we might have collected, it has been said, the whole text, not only of the Gospels, but almost all of the Old and New Testaments. At this point, then, there is no question. No one can dispute the existence of the Gospels in the age of Origen, or that immediately proceeding—that is to say, in the beginning of the 3d c. But we can ascend with an almost equally clear light of evidence to the time of Irenæus, or the last quarter of the 2d c. The passage in which Irenæus speaks of the G. is so significant and important that it deserves to be extracted. 'We,' he says (*Contra Hæres.* lib. iii. c. 1), 'have not received the knowledge of the way of our salvation by any others than those through whom the Gospel has come down to us; which Gospel they first preached, and afterward by the will of God, transmitted to us in writing, that it might be the foundation and pillar of our faith. For after our Lord had risen from the dead, and they [the apostles] were clothed with the power of the Holy Spirit descending upon them from on high, were filled with all gifts, and possessed perfect knowledge, they went forth to the ends of the earth, spreading the glad tidings of those blessings which God has conferred upon us. *Matthew among the Hebrews published a Gospel in their own language; while Peter and Paul were preaching the Gospel at Rome and founding a church there. And after their departure [death], Mark the disciple and interpreter of Peter himself delivered in writing what Peter had preached; and Luke, the companion of Paul, recorded the Gospel preached by him. Afterward, John, the disciple of the Lord, who leaned upon his breast, likewise published a Gospel while he dwelt at Ephesus in Asia.*' These words are very explicit and to the point: and elsewhere Irenæus speaks still more particularly of the several G., and endeavors to characterize them in a

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somewhat fanciful way, which, if it proves not his own judgment, proves at least the kind of veneration with which the G. were regarded in his time. It is equally beyond question, then, that the G. were in existence in the end of the 2d c., and that they were attributed to the authors whose names they bear. 'It is allowed by those who have reduced the genuine apostolic work to the narrowest limits, that, from the time of Irenæus, the new Testament was composed essentially of the same books as we receive at present; and that they were regarded with the same reverence as is now shown to them.'—Westcott, *History of Canon*. The evidence on which we accept as undoubtedly genuine the productions of many classic authors, is not to be compared in clearness and fulness to the evidence for the genuineness of the G. at this stage. Any difficulties that the subject involves begin at a point higher up than this.

The age of Irenæus is the *fifth* generation from the beginning of the apostolic era—only the *third* from the termination of it. The ascending generations, as we recede from Irenæus may be characterized as (4) of Justin Martyr (3) of Ignatius and Papias; (2) of the apostle John, or the later apostolic age. It is within these three generations, and especially within the third and fourth, that the subject of the genuineness of the G. can possibly give any cause for hesitation and discussion.

Such writers as Justin Martyr and Ignatius nowhere quote the G. by name. In a fragment of Papias preserved by Eusebius, there is mention of Matthew and Mark having written accounts of the actions and discourses of our Lord; but with this exception there is no mention of the G., or of their authors by name, in these earlier Christian writers. Not only so, but Justin Martyr appeals constantly to sources of information which he styles not 'Gospels' of Matthew, Luke, or John, but *Memoirs of the Apostles* (*apomnēmoneumata tōn apostolōn*). The phrase *a kaleitai euaggeliū* (which are called gospels), which follows the former in the common versions of Justin's text, is supposed by many to be an interpolation. This has given rise to a good deal of discussion as to the effect of Justin Martyr's evidence on this subject. The discussion has been of this nature. Were these *Memoirs of the Apostles* our Gospels, or were they some other books of information as to Christ's sayings and doings to which Justin had access? Many German critics have been confident that these were not our Gospels; and Bp. Marsh has gone the length of saying, that Justin did not quote our Gospels. Though the question is not altogether free from difficulty, there appears no reason for doubt that the *Memoirs of the Apostles* to which Justin constantly refers were our Gospels. This seems conclusively established by the three following considerations: (1) The degree of coincidence which exists between the numerous passages which Justin quotes from his *Memoirs*, and the corresponding passages in the G.—The *verbal* coincidence with the very text of the G. is sometimes exact, and sometimes so nearly so as to appear exact in a translation. The want of entire verbal coincidence is just what might

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be expected in a writer like Justin, who quotes the Old Testament in the same general manner, and is the very same that we find in other writers both before and after him. Further, the account which he gives of the origin of the *Memoirs* corresponds with the origin of the G.—viz., that two were written by apostles, and two by companions of the apostles. (2) The extreme improbability that there could have been other books beside the G. of the same apparently authoritative character, all traces of which have disappeared, and of which, in fact, we find no indication anywhere except in Justin Martyr.—Everything tends against such a supposition. The books of which Justin speaks were read in the assemblies of the Christians on Sundays; they were regarded with respect and veneration; they were evidently held authoritative. It is wholly inconceivable, that if there were such books other than the G., they should not have been mentioned by other writers as well as Justin; or that they should have utterly perished. (3) The certainty, from the statements of such writers as Irenæus in the generation immediately following him, that Justin must have known our Gospels.—In this later generation we find the G. everywhere diffused: received and revered alike at Alexandria, Lyons, and Carthage; by Clemens Alexandrinus, Irenæus, and Tertullian. They could not all at once have attained this wide diffusion, or started into this position of authority. The manner in which Irenæus speaks of them can be accounted for only by the fact, that he had received them from his teachers; that they had been handed down to him as inspired authorities from the first ages. We must take the light of such a statement with us in ascending to the age of Justin Martyr; and in this light it is unintelligible that the G. should not have been known to Justin, and consulted by him. The mere fact of his calling his authorities by the peculiar name of *Memoirs* cannot be set against this evidence. The name of *Memoirs*, indeed, rather than Gospels, was only a natural one for this writer to use, with his classical predilections and philosophical training, and considering that he was addressing a heathen emperor, and through him the Gentile world at large. Indeed, Justin's term so admirably descriptive, of the nature and character of these writings, can be used as an argument for, more properly than against, his reference to our Gospels, whose evident purpose is to give only some *memorable* things concerning Christ.

When we ascend beyond the age of Justin to Ignatius and Papias we find in a fragment of the latter, as already stated, mention of Matthew and Mark having written accounts of the life of the Lord; while in the letters of the former, as in the still earlier epistle of Clemens Romanus and the so-called epistle of Barnabas—both of which belong to the 1st c., and consequently reach the apostolic age itself—we find various quotations made apparently from the G. The quotations from Matthew are the most numerous. If these quotations stood by themselves, it might be doubtful how far they constituted evidence of the exist

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ence of the G. at this early period. They might possibly indicate merely a uniformity of oral tradition as to the sayings of our Lord; but when we regard them in connection with the position of the writers, and the whole train of thought and association in which they occur, they indicate the G. as written records, known and established in authority. The existence and character of such men as Ignatius and Clemens are unintelligible except in the light of the Gospel history.

In addition to this chain of direct catholic evidence for the genuineness of the G., the fragments which have been preserved of heretical writers furnish important, and in some respects singularly conclusive evidence. The Gnostic Basilides quotes the Gospels of John and Luke about 120. The heretics appealed to them as well as the catholic writers, and this fact is a strong guarantee that no fictions or inventions could have been palmed off on the church in the 2d c., as is virtually supposed by the most renowned German theory as to the origin of the Gospels. Upon a review of all the evidence from the apostolic fathers down to the council of Laodicea, when the four Gospels are reckoned as part of the canon of Scripture, 'there can hardly be room for any candid person to doubt,' it has been said, 'that from the beginning the four Gospels were recognized as genuine and inspired—that a line of distinction was drawn between them and the so-called apocryphal Gospels.' As a mere question of literary history, the genuineness of the G. certainly rests on far higher evidence than that on which we receive, without hesitation, many ancient writings.

2. *Purpose.*—The G. were intended not as complete biographies of the Lord Jesus, but as memoirs, or in Justin Martyr's word, *Memorabilia*; presenting him in his living personality by simple narratives of such selected scenes, acts, or words, as manifested those points of Christ's character which were prominent in the writer's thought, and necessary to make Christ known to the readers. This humbleness of aim, and this simplicity in method, give the G. as merely literary compositions, their unrivalled beauty and their convincing power. The source of this beauty and power, the Christian believer traces to the Divine inspiration which moved these humble men thus to set forth Christ as the Redeemer of men; so that they were the instruments of the great purpose of God's grace.

3. *Internal Character, Relation, and Comparison.*—After the genuineness of the G. the next point of importance is the relation which they bear to one another in respect of their contents and arrangement—the coincidences and discrepancies with one another which they present. The most obvious distinction among the G. as a whole is between the Gospel of John and the three Synoptical Gospels, as they are called. Matthew, Mark, and Luke, in narrating the history, discourses, and miracles of the Lord, confine themselves exclusively to what took place in Galilee until the last journey to Jerusalem. We should not know from them of the successive journeys that our Lord made

to Jerusalem. John, on the contrary, brings into view prominently his relation to Judea; and of the discourses delivered in Galilee, he records only one, in chap. vi. It is obvious, at a glance, that John had a special object in writing his Gospel, an object not less *historical* in essence than the others, though dealing with a sphere larger and higher than all the histories of earth. It is probable that he purposely abstained from writing what others had recorded, and sought to bring into prominence as the basis of all Christ's life in the flesh, his life with the Father—the Word that was in the beginning with God, and was God, and had become flesh, and whose glory had been seen by many witnesses as the glory of the only begotten son.—A comparison of the three Synoptical Gospels reveals some interesting results. If we suppose them respectively divided into 100 sections, we shall find that they coincide in about 53 of them; that Matthew and Luke further coincide in 21; Matthew and Mark in 20; and Mark and Luke in 6. This, of course, applies to the substantial coincidence of fact and narrative in each case. The relative verbal coincidence is by no means so marked; it is, however, considerable, and presents some interesting features, which Prof. Andrew Norton has set forth clearly in his admirable work on the *Genuineness of the Gospels*.

The result of the extremely critical and minute scrutiny to which the text of the Gospels has been subjected may be stated as follows. There is a singular coincidence in substance in the three Synoptic Gospels. 'Substantial unity with circumstantial variety,' is a saying strictly true of them—more true of them than of any other authors professing to narrate the same circumstances. The coincidence is greatly more apparent in the discourses than in the narrative parts of the G. most apparent in the spoken words of the Lord. At the same time, there are certain portions of narrative of great importance, that show in the several evangelists almost a verbal coincidence, as in the call of the first four disciples and the accounts of the transfiguration. 'The agreement in the narrative portions of the G. begins with the baptism of John, and reaches its highest point in the account of the passion of our Lord, and the facts that preceded it; so that a direct ratio might be laid between the amount of agreement and the nearness of the facts related to the passion. After this event, in the account of his burial and resurrection, the coincidences are few.' There are no parts that furnish more difficulty, in the way of formal harmony, than the narratives of the resurrection.—The apparent discrepancies between the accounts given in the different Gospels—formerly often adduced as an argument against their truthfulness—are not now so much used in that direction. Many of them indeed are even recognized as evincing utter absence of collusion among the writers, and so as tending in general to establish their truthfulness. Not one can be claimed as at all affecting any element important in the narrative; and all are of such a nature as to lose their importance with the subsidence of the merely mechanical theory

of inspiration, and the growth of views more vital and spiritual.

The language of all the G. is well known to be Greek with Hebrew idioms, or what has been called Hellenistic Greek. The tradition, however, of a Hebrew original of Matthew's gospel is uniform. In the fragment of Papias, and in the statement of Irenæus—the earliest sources in which we have distinct mention of the G.—it is plainly asserted that Matthew wrote his Gospel in the Hebrew dialect: the fact is made a mark of distinction between his Gospel and the others. The same uniformity of tradition ascribes the Gospel of Mark to the teaching of the apostle Peter. The Gospel of Mark is the most summary of the three, yet, in some respects, it is stamped with a special individuality and originality. It describes the Lord's acts, and scenes of his life, and other acts and scenes with minutely graphic detail, throwing in particulars omitted by the others, and revealing throughout the observant eye-witness and independent historian.

4. *Origin of the Gospels.*—This is a separate inquiry from their genuineness, though intimately connected with it, and springs immediately out of those facts as to the internal agreement and disagreement of the Gospels above noted. The inquiry has been treated in an extremely technical manner by many critics, and various theories have been propounded on the subject. Generally the object of these theories has been to find a common original for the G. Some profess to find such an original in one of the three Synoptical Gospels, from which the others have been more or less copied, and each of them in turn has been taken as the basis of the other two. The more elaborate theories of Eichhorn and Bp. Marsh, however, presume an original document, differing from any of the existing Gospels, and supposed to have passed through various modifications, into the threefold form which it now bears in them. It appeared to Eichhorn that the portions common to all the three Gospels were contained in a certain common document from which all three drew. It had been already assumed that copies of such a document had got into circulation, and had been altered and annotated by different hands. But Eichhorn works out an elaborate hypothesis on such a presumption. He requires for his purpose no fewer than five supposititious documents: the conditions of the problem cannot be met otherwise. These are in order: 1. An original document; 2. An altered copy which Matthew used; 3. An altered copy which Luke used; 4. A third copy made from the two preceding, used by Mark; 5. A fourth altered copy used by Matthew and Luke in common. Bp. Marsh, following out the same process of construction, finds it necessary to increase the supposititious documents to eight. There is not the slightest external evidence of the existence of such documents; and theories of this kind, which, in order to explain difficulties, call into existence at every stage an imaginary solution, do not require serious refutation.

Another and more probable supposition is, that the Gos-

pels sprang out of a common oral tradition. The preaching of the apostles was necessarily, to a great extent, a preaching of facts; and so zealously did they give themselves to the task of promulgating the wondrous life, works, sayings, character, and death of Christ, that they early divested themselves of the labor of ministering to any of the lower wants of the congregations of disciples that they gradually gathered round them. It is obvious that, in the course of their active 'ministry of the word,' the facts of the Lord's life, of which they had been eye-witnesses, would gradually assume a regular outline. What the reading of the G. is to us, the preaching of the apostles would be to the early Christians. The sermon of the apostle Peter at Cæsarea (Acts x. 34) may give some imperfect idea of the character of this preaching. The facts thus briefly indicated would expand in frequent communication to something of the more detached and living form which they exhibit in the G., or rather in what we may suppose to have been the common substratum or ground-work of the G. It to be remembered that the apostles were promised that the Holy Spirit would 'bring all things to their remembrance, whatsoever the Lord had said unto them.' And this constant guidance and superintendence of the Divine Spirit would sufficiently account for the uniformity and consistency of their oral instruction, even though not reduced to writing for a considerable number of years. Allowing for the widest space of years that it may be necessary to assume before the writing of the first Gospel, the chief apostles themselves are yet living at the end of this space. It is not a mere tradition of their teaching that survives, but it is their own living witness that is circulated from church to church, as they pass to and fro in their evangelistic labors.

It is impossible to say whether this hypothesis of the origin of the G. be really the correct one; all we need say is, that it seems to possess more probability in itself than any hypothesis of a common written source, from which they were respectively borrowed, and which has disappeared. It fits, moreover, into the facts of the case.—Westcott, *Introduction to the Study of the Gospels*, p. 189.

According to this view of the origin of the Gospels, that of Mark, if not the oldest in composition, is yet probably the most direct and primitive in form. In its life-like simplicity and comparative unconsciousness of aim, it represents most immediately the apostolic preaching; it is the testimony delivered by the apostle Peter, possibly with little adaptation. Historical evidence, as we have already said, is uniform as to the association of Mark and Peter: Mark is everywhere *interpretæ Petri*. The Gospels of Matthew and Luke, 'represent the two great types of recension to which it may be supposed that the simple narrative was subjected: Luke represents the Hellenic, and Matthew the later Hebraic form of the tradition, and in its present shape Matthew seems to give the last authentic record of the primitive Gospel.'

A common oral Gospel also presents the most natural ex-

planation of the accordances and variations of the three synoptic Gospels. The words of the Lord, which present in all such a marked uniformity, would necessarily assume a more fixed character in such an oral tradition, while the narrative surrounding them would remain comparatively free. Single phrases of a peculiar and important character would be closely retained; there would be, exactly as we find, a uniform strain of hallowed language mingling with variations in detail—a unity of tone, and even of speech, with variety of modulation and emphasis.

The development of the famous Tübingen theory of the origin of the Gospels, by F. C. Baur (q.v.), was for some time thought to mark an important epoch in critical study. He sought the cause of the difference in the characteristics of the several G., not in vague myths or the fantasy of individuals, but in the dominant spiritual tendencies of the apostolic age. Needing greater scope for the influence of such tendencies, he found it by adopting the view that the latest of the G., John's, was not written till about 170. The most characteristic thought of Bauer's criticism was that the Gospel of John is not a historical record, but a designedly dogmatical work, in which the historical element is but the transparent envelope of the theological truths, and is used as the artistic setting for a body of profound religious thought. The Tübingen attempt, though ingenious and interesting, is now a conceded failure; some of its leading adherents have discarded some of its prominent points. Meanwhile, Weisse, Meyer, Bernhard Weiss, and others, have developed the genuineness of Mark, deeming it the primitive Gospel and a faithful record.

The literature is most voluminous. The chief recent names are Bleek, Ewald (against Baur), Weizsäcker, Hilgenfeld, Holtzmann, Schenkel, Keim, and Weiss. For the 'orthodox' view, see Canon Westcott's *Introduction to the Study of the Gospels*. Sanday's *Authorship and Historical Character of the Fourth Gospel*, and Ezra Abbot's *The Authorship of the Fourth Gospel* (Boston 1880), are the ablest works in English on the Gospel of John. A valuable work is Prof. George P. Fisher's *The Beginnings of Christianity* (New York 1877). See the separate titles of the Gospels: also BIBLE.

GOSPORT, *gōs'pōrt* ['God's port']: market-town and seaport of England, county of Hants, on the w. shore of Portsmouth harbor, directly opposite Portsmouth, with which it is connected by a floating bridge. It is 14 m. s.e. of Southampton, 89 m. s.w. of London by the London and Southwestern railway. It is inclosed with ramparts, which seem a portion of those which surround also Portsmouth and Portsea. The Haslar gun-boat ship-yard, connected with the town, is used for hauling up and keeping in repair all the gun-boats belonging to this port. An extensive iron foundry for manufacture of anchors and chain-cables, and considerable coasting-trade are here carried on. The main feature of G., however, is the *Royal Clarence Victualing Yard*, which contains a brewery, a

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steam biscuit-baking establishment, and numerous store-houses. The bakery can turn out ten tons of biscuit in one hour. In the immediate vicinity is Haslar Hospital, erected 1762, chief establishment in Great Britain for invalid sailors, of whom 2,000 can be accommodated and supplied with medical attendance. Pop. of G. about 7,000; with Alverstoke (1881) 21,671; (1891) 25,457.

GOSS, n. *gōs* [see GORSE, of which *goss* is an inaccurate spelling]: in *OE.*, furze; gorse.

GOSSAMER, n. *gōs'sā-mēr* [properly *God's summer*, so called from the legend that the *gossamer* is formed from the parts of the Virgin Mary's winding-sheet, which fell away in fragments when she was taken up to heaven]: light filamentous substance, which often fills the atmosphere to a remarkable degree during fine weather in the latter part of autumn, or is spread over the whole face of the ground, stretching from leaf to leaf, and from plant to plant, loaded with entangled dew-drops, which glisten and sparkle in the sunshine—hence anything unsubstantial or flimsy. GOSSAMERY, a. *-mēr-ī*, flimsy; unsubstantial. *Note.*—It is urged from a variety of considerations that the derivation of GOSSAMER is really *goose-summer*, from the downy appearance of the film. The Gael. name is *cleit lusan* = down on plants; *summer-cout* = summer-colt, is the Scotch for the misty exhalations seen rising from the ground in hot weather—see Skeat. Again, it is said to be the Gael. *gath*, a dart, a sunbeam; and *samhra*, summer; thus named *ga-samhra* from the resemblance of the white floating objects to rays of light—see Dr. C. Mackay. See Wedgwood for that of the text. Various opinions were formerly entertained concerning the nature and origin of *gossamer*, but it is now ascertained to be produced by small spiders, not, however, by any single species; but by several, probably many, species; while it is also said to be produced by young, and not by mature spiders, which, if a fact, would help to account for its appearance at a particular season of the year. The production of *gossamer* by spiders was demonstrated first by the observations of Dr. Hulse and Dr. Lister, 17th c., but these observations were long discredited. It is not yet known whether the *gossamer* spread over the surface of the earth is produced by the same species of spider which produce that seen floating in the air, or falling as from the clouds. Why *gossamer* threads or webs are produced by the spiders at all, is also not known. That they are meant merely for entangling insect prey, does not seem probable; the extreme eagerness which some of the small spiders known to produce them show for water to drink, has led to the supposition, that the dew-drops which collect on them may be one of the objects of the formation of those on the surface of the ground, while it has been also supposed that they may afford a more rapid and convenient mode of transit from place to place than the employment of the legs of the animal. As to the *gossamers* in the air, conjecture is still more at a loss. They are

certainly not accidentally wafted up from the ground, as might be supposed; the spiders which produce them are wafted up with them; but whether for the mere enjoyment of an aerial excursion; or in order to shift from place to place, is not clear, though the latter supposition is most probable. The threads of gossamer are so delicate that a single one cannot be seen unless the sun shines on it; but being driven about by the wind, they often become beaten together into thicker threads and flakes. They are often felt on the face when they are scarcely visible. The spiders which produce these threads shoot them out from their spinnerets; a viscid fluid being ejected with great force, which presently becomes a thread; sometimes several such threads are produced at once in a radiating form, and these being caught by the ascending current of heated air, are borne up, and the spider along with them. It has been said that the spider has even some power of guiding in the air the web by which it is wafted up.

GOSSAN, n. *gōz'zān*: among *Cornish miners*, the peculiar ferruginous condition of the top of a vein near its outcrop, considered to be very strongly indicative of the lode below; ferruginous quartz.

GOSSART (or GOSSAERT), JAN DE (known as MABUSE): about 1499–1562; b. Maubeuge, Hainaut, Belgium: painter. Little is known of his early life except that he became a member of the guild of St. Luke in Antwerp 1503. He is supposed to have studied painting in Italy, and practiced it some years in Antwerp. Subsequently he visited England; took service with Philip of Burgundy, with whom he travelled in Italy, Spain, and Denmark; and at Philip's death retired to Middleburg in the service of Philip's brother Adolph. His most celebrated painting was *The Descent from the Cross*, containing 50 figures, ordered for the high altar of the monastery of St. Michael of Tongerlo, Middleburg, and destroyed by fire 1568. Other noted ones were: *The Wise Men's Offering*, secured for the collection of the Earl of Carlisle; *Neptune and Amphitrite* (1516); several *Madonnas*; *Adam and Eve*; *St. Luke Painting the Portrait of the Virgin*; *Christ and His Scoffers*; and portraits of Leonora of Portugal, the children of the king of Denmark, several of the royal family of England, and many persons of distinction in the reign of Henry VIII. G. delighted in strongly contrasted colors, and often employed elaborate architectural backgrounds. Many of his figures were stiff and conventional; but in some there is a quiet dignity.

GOSSE, *gōs*, EDMUND WILLIAM: author: b. London, 1849, Sep. 21; son of Philip Henry G., F.R.S. He was educated at Devonshire, appointed asst. librarian at the British Museum 1867, and has been translator to the board of trade since 1875. He visited Norway, Denmark, Sweden, and Holland 1872–7 to study their literature; became Clark lecturer on English literature in Trinity College, Cambridge, 1884; received the degree M.A. from Cambridge Univ. 1885; and delivered a series of lectures in

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Harvard, Yale, and Johns Hopkins Universities, and in New York 1884-5. He has published *Madrigals, Songs, and Sonnets* (1870); *On Viol and Flute*, lyrics (1873); *King Erik*, tragedy (1876); *The Unknown Lover*, drama (1878); *New Poems* (1879); *Firdausi in Exile, and Other Poems*, (1886); prose, *Northern Studies* (1879); *Life of Gray*, 'English Men of Letter Series' (1882); 50 essays in Ward's *English Poets* (1880-1); *Seventeenth Century Studies; a Contribution to the History of English Poetry* (1883); *From Shakespeare to Pope* (1885); *History of Eighteenth-Century Literature, 1660-1780* (1889).

GOSSELIES, *gös-séh-lé'*: town of Belgium, province of Hennegau or Hainaut, four m. n. by w. from Charleroi, on the canal from Charleroi to Brussels. It has manufactures of woolen cloth, hats, nails, cutlery, soap, etc.; also bleach-fields and tanneries. There are coal mines near. Pop. abt. 7,000.

GOSSIP, n. *gös'síp* [AS. *Godsibb*, related in God as a sponsor in baptism, a gossip—from *god*, God; *sib*, place, relationship: Ger. *sippe*, affinity: Goth. *sibja*, relationship]: originally, a sponsor, a neighbor, or friend; an idle tattler; a busy teller of news; small-talk; scandal: V. to run about among neighbors and engage in idle talk; to engage in much small-talk; to tattle. **Gossiping**, imp. **Gossiped**, pp. *-sǐpt*. **Gossipry**, n. *-rǐ*, special intimacy; idle talk. **Gos'sipy**, a. *-ǐ*, full of gossip; chatty.

GOSSOON, n. *gös-són'* [Ir.: F. *garçon*, a little boy]: in *Ireland*, a big, clumsy boy; a lad in a great house employed in menial kitchen-work, and as a messenger.

GOSSYPÍUM: see **COTTON**.

GOT, pt., and **GOTTEN**, pp. of **GET**, which see.

GOT, *gō*, **FRANCIS JULES EDMUND**: comedian: b. Lignerolles, Orne, France, 1822. Oct. 1. He was educated in Charlemagne College, employed at the prefecture of the Seine, entered Provost's class at the Conservatory 1841, took the second prize for comedy 1842, and the first 1843, served in the army one year, and made his first appearance on the stage at the Comédie Française Paris, 1844. He became a sociétaire 1850, has played a great number of parts in the old classical dramas, and created scores of original characters in modern pieces, and as prof. of the Conservatory had the cross of the Legion of Honor publicly conferred upon him 1881, Aug. 4.

GÖ'TA: river in Sweden: see **GOTLAND**.

GO'TAMA: see **BUDDHISM**.

GOTH, n. *gōth* [L. *Gothi*; Gr. *Gothoi*]: one of an ancient tribe or nation which took an important part in the overthrow of the Roman empire (see **GOTHS**), any one rude and uncivilized; an enemy to the fine arts, or one destitute of a taste for them—*Vandal* is also employed in the latter sense. **GOTH'IC**, a. *-ǐk*, of or belonging to the Goths or their language; designating the architecture of the middle ages (see below). **GOTH'ICIZE**, v. *-ǐ-sīz*, to reduce to barbarism. **GOTH'ICIZING**, imp. **GOTH'ICIZED**, pp. *-sīzd*. **GOTH'ICISM**,

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n. -*sizm*, rudeness of manners; a Gothic idiom; conformity to Gothic architecture. *Note.*—The *Ostrogoths* and *Visigoths*—that is, the *East-Goths* and *West-Goths*—were names applied to those who settled on or near the Black Sea and up to and on the Danube; the *Masogoths* were those who settled in Moesia; the *Saio-Goths* were those who settled in Scandinavia.

GOTHA, *gō'tá*: town of Germany, cap. of the duchy of Saxe-Coburg-Gotha, on an elevation in a beautiful district on the right bank of the Leine, 18 m. w. of Erfurt, by the Thuringian railway. It is a handsome, well-built town, is quadrilateral in form, and was formerly surrounded by walls, which have been thrown down, and public walks laid out in their place. The principal public building is the large ducal palace of Friedenstein, with two large side-wings and two towers 144 ft. in height. This palace contains a picture-gallery, in which Cranach, Van Eyck, Holbein, Rubens, and Rembrandt are represented; a cabinet of engravings (very valuable); a library (founded by Ernst the Pious 1640) of 170,000 vols. and 6,000 manuscripts (2,000 Arabic); a cabinet of Egyptian, Roman, Greek, and German antiquities; a collection of about 80,000 coins and 13,000 medals (one of the finest collections in Europe), and a Japanese and Chinese museum. G has also an arsenal, a new and old town-hall, and numerous educational and benevolent institutions. The principal manufactures are porcelain, colored paper, cloth, tobacco, sugar, toys, machinery, musical and surgical instruments, etc. Gotha sausages have a widespread celebrity. Several hundred designers, engravers, printers, and colorers of maps are employed here in Justus Perthes's large geographical est. Pop. (1875) 22,928; (1900) 34,651.

GOTHA, ALMANACH DE: universal political register, published annually at Gotha (q.v.). The publication began 1764, in the German language, in which it was continued until Napoleon I. became emperor, when it was changed to French: it has recently been published in both tongues. The almanac is a small pocket volume, containing at present nearly a thousand pages of small type, and recording the sovereigns and royal families of every civilized country, with the civil, diplomatic, military, and naval officers, a great amount of statistical information; a compact summary of historical events, obituary notices of the most distinguished persons, and other matters of political interest. No other book ever printed contains so much political and statistical information in so small a compass. The boundaries of states are given according to the latest treaties, with their extent, population, and revenues. The *annuaire diplomatique* contains the name of every diplomatic representative and *attaché* of Europe and America. The pay of officers of governments, national expenditures and debts, with the interest, the number of representatives, under representative governments, and their proportion to the population, are carefully given. As a work of such an extent cannot be brought down to

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the end of the year, the date of publication is stated, and in some instances a date has been given to each page, as completed, to show that the editor is not answerable for subsequent changes. When the *Almanach de G.* was commenced, there was but one republic in existence—that of Switzerland. It was then little more than a register of the crowned heads and royal families of Europe. It has been slow to recognize political changes, and for years after the French Revolution, continued to print under the head of 'France,' Louis XVII. as the reigning monarch. It was not until Napoleon became emperor that his name found a place in its pages, and then his whole family was given, as with the other royal houses. During the empire, Napoleon I. considered this little publication so important, that he exercised over it a rigid supervision, and in 1808, an entire edition, which had just been worked off, was seized because Anhalt took precedence of Napoleon. To secure this re-arrangement of the alphabet, the edition of that year was printed at Paris. It is probable that a similar supervision of the press kept out of the historic pages the successes of the allies against the empire in the succeeding numbers, in which there was no mention of the campaigns of the Peninsula, and the victory of Trafalgar. On the restoration of the Bourbons, however, these events were recorded in a *resumé*.

GOTHA, DUCHY OF: see SAXE-COBURG-GOTHA.

GOTHAM, *gōth'am* or *gō'tham*; parish in Nottinghamshire, England. When King John proposed visiting the place with the view of purchasing a castle and grounds and sent messengers to prepare for his reception, the people, unwilling to support the additional expense of a royal estate, engaged with common accord in all manner of idiotic pursuits. The messengers reported the place full of fools, and the royal project was abandoned. Afterward the people remarked that more fools passed through G. than remained in it, and they became known as the 'wise men of Gotham.' Subsequently 'a wise man of Gotham' became equivalent to a fool. The word was also applied sarcastically to the city of New York by Irving and Paulding in their *Salmagundi*; and the citizens are sometimes familiarly called Gothamites.

GOTHAMITE, n. *gōth'ām-īt*, or GOTH'AMIST, n. *-mīst*: a man of *Gotham*, a village in Nottinghamshire, whose habits were noted for their real or supposed simplicity—hence ironically, the wise men of Gotham; a simpleton.

GOTHARD, *gō tār'*, St.: mountain group in the Helvetic Alps, reaching in its highest peaks 12,000 ft.: see ALPS. St. G. is famous chiefly for the pass over the Alps, 6,800 ft. in height at its summit. Through this pass, the high-road from Fluelen, on Lake Lucerne, is carried without interruption in a s.s.e. direction to Lake Maggiore, in n. Italy. The road over the pass, made 1820–32, was in great part destroyed by violent storms 1834 and 39. Since that time, however, it has been in good condition. It is one of the best and most convenient of the Alpine carriage-

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ways, is free from snow for four or five months of the year, and is remarkable for the grandeur of its scenery. In 1870 Germany, Italy, and Switzerland signed an agreement for the construction of a railway with a tunnel through the St. Gothard. The chief difficulty in the way of apportioning the expense was removed 1879, when the Swiss confederation agreed to bear part of the burden with the several Swiss cantons through which the line passes, and the two Swiss railways. Operations were begun 1872, Oct.; the workings from opposite sides met 1880, Feb. The length of the tunnel, the greatest undertaking of the kind attempted by man, is $9\frac{1}{4}$ m; cost, estimated at more than £9,000,000.

GOTHENBURG: see GOTTENBORG.

GOTHENBURG SYSTEM: a system that originated in Gothenburg, Sweden, for regulating the liquor traffic. Its chief features are the doing away with private gain from the sale of spirits, the placing of public houses under the charge of state agents, and the use of the profits for public improvements. This system went into effect in Norway 1896. Spirits are not allowed to be retailed before 8 A.M. or after 1 P.M. on Sundays and holidays and on the days preceding them. While it has been asserted by some that under this plan the liquor trade has been kept within bounds and that public morals have been improved, others declare that there is no material abatement of the evils of the licensed saloon. In Norway the communal organizations determine the number of places at which spirits shall be retailed, and the choice of a manager for each of such places has to be approved by the local municipality.

GOTHIC ARCHITECTURE. various styles of architecture which prevailed in w. Europe from the middle of the 12th c. to the revival of classic architecture in the 16th c. The term *Gothic* was at first bestowed by the Renaissance architects on the mediæval styles as a term of reproach. This epithet they applied to every kind of mediæval art which had existed from the decline of the classic styles till their revival, all other styles being by them considered as *barbarous* and *Gothic*. The name has now, however, become generally adopted, and has outlived the reproach at first implied in it. It has also become limited and defined in application. During the present century, the arts of the middle ages have been attentively studied, and their origin and history carefully traced; and as the knowledge of these styles has increased, a feeling of admiration has succeeded to that of contempt, and Gothic now ranks as one of the noblest and completest styles of architecture ever invented.

Origin.—The origin of G. A. has given rise to many very ingenious speculations. It has been said that the style was copied directly from nature; that the pointed arches and groins of the vaults were imitated from the overarching branches of trees; and that the stems of an avenue were the originals of the pillars of the Gothic aisles. Others have strenuously maintained that the invention of the pointed arch was a mere accident, arising from this form having been observed in the interlacing of the circular arches of a Norman arcade. It has also been stated that the style was imported from the East during the Crusades, and that the mediæval architects had but little to do with its origin. More careful study of the Gothic buildings which remain to us, has dispelled these fanciful ideas, and settled the origin and progress of the art on historical as well as internal evidence. To trace G. A. up to its primary elements, we should have to go far back in the world's history. Some maintain that there are only two styles of architecture of which we have any knowledge—viz., Greek and Gothic; that these are the two typical styles, and that in them are contained all the elements of which all other styles are composed. This is no doubt to some extent true, as it is also true that all things in nature are derived from a few primary elements. But as there are many varieties in nature, so there are many developments of the two typical forms of architecture, all of which deserve to be classed as styles.

Greek architecture is the type of the trabeated style—i. e., the style whose principal feature is the straight lintel; Gothic is the type of arcuated architecture, in which the voids are spanned by arches. Of these typical forms there are many varieties. Roman architecture (q. v.) is the transition form between them. The Romans adopted the Greek form of decoration and the Gothic form of construction; they decorated their exteriors with columns crowned by straight architraves and cornices, and inside these they formed the real construction with arches and vaults. The use of the latter gradually extended, especially

in the construction of interiors, and by means of vaults the Romans were able to roof in large areas without encumbering the floor with pillars. This was found to be a very advantageous system of construction, and was carried out in many important instances, e.g. in the baths of Caracalla and Diocletian (see BATHS), the Basilica of Constantine, etc. In their works of public utility, where use, not decoration, was the chief object, the Romans always adopted the arch as the fittest mode of construction—as in their aqueducts (q.v.), bridges, etc. The arch thus came gradually more and more into use; and about the time when the barbarians first overran the provinces, the arcuated form of construction was universal, and some attempts had been made to conform the Greek decoration to the circular arches by bending the entablature round the curve—as in the palace of Diocletian at Spalato, in Dalmatia.

To the Romans, therefore, is due the introduction of an arcuated construction with a well-developed internal, and a partially developed external decoration. The early Christians adopted their forms of construction and decoration from the Romans. They were indebted to them also for the plans of the buildings, which became the types of the Christian sacred edifices during the middle ages. The Basilica (q.v.), or Roman court-house and market-place, was found to be admirably adapted for early Christian worship, and the circular temples were the prototypes of the Christian Baptisteries (q.v.) which usually accompanied the basilicas. In erecting their buildings, the Christians not only adopted the plans and mode of construction, but used the actual materials of the buildings of the Romans, many of which had been destroyed by the barbarians. Where such materials were abundant—as in Rome and Central Italy—the early Christian architecture very closely resembled that of the Roman buildings which had preceded it. But in more remote districts the builders, finding no ready-made materials at hand, had to design and prepare new ones. In doing so they followed as closely as they could the Roman originals, but their buildings partook more of the constructional than the decorative elements of Roman architecture. The Roman ornament thus dropped out of use; and when, in process of time, decoration was desired, each new people followed its own ideas. The traditional Roman decoration thus became to a great extent lost, and new styles introduced. These new styles each retained some of the original Roman forms and modes of construction; and each style depended for its peculiar character on the particular Roman forms that it retained and developed. Thus Constantine, and the architects of the East, seized upon the *dome* as the distinguishing feature of their style, and the architects of Lombardy adopted the plain tunnel-vault. The former style is called Byzantine (q.v.), and has been the type of all Eastern mediæval architecture; and the latter Romanesque (q.v.), and has been the origin of all the western architecture of mediæval Europe.

History.—From Lombardy—in those ages part of the German empire—the Romanesque style readily passed into

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Germany and Switzerland, and was also most naturally adopted in s. France, where examples of Roman architecture abounded. This architecture was carried out with various modifications in these different countries, all of which may have contributed to the general progress of the art; but as might be expected, it is to the banks of the Rhine where the successors of Charlemagne chiefly dwelt, that we must look for the first step in the development of G. A. A glance at the development of vaulting will show how this occurred.

The Roman basilicas, and, like them, the early Christian churches (fig. 1), were divided into a central nave with two aisles (often called side-aisles), the nave separated from the aisles by a row of columns on each side. These columns carried arches on which rested the side-walls of the nave, which were carried sufficiently high to clear the roofs of the aisles, and admit windows to light the central nave. This row of windows afterward became the Gothic Clere-story (q.v.). The apse at the end of the nave was semicircular on plan, and was usually roofed with a vault in the form of a semi-dome. This feature also was afterward more fully developed in the chapels of Gothic churches. The nave and aisles were originally roofed with wood, but, owing to their frequent destruction by fire, it became necessary to cover the churches with a more enduring construction. Vaulting was then introduced, the Roman forms, of which many examples existed, being at first closely followed. To trace the progress of vaulting from the simple tunnel-vault of the Romans to the fully developed and magnificent groins of Gothic cathedrals, is a most interesting inquiry; and, indeed, includes the history of the development of G. A. There is one consideration which will

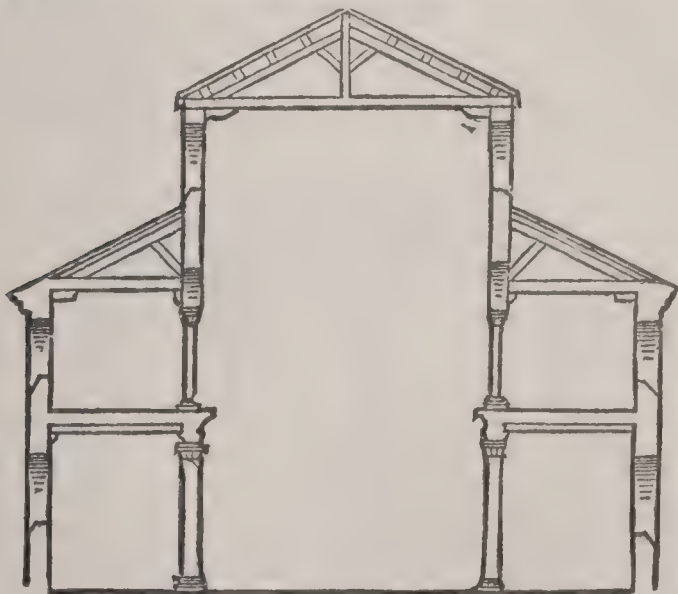


Fig. 1.

help to explain how the Roman arches were abandoned and new forms sought out. To the Roman emperors who built the splendid vaults of the baths, and who had a subdued world at command, *materials* and *labor* were a small consideration. They could, therefore, afford to build in a

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style which required perfect materials and workmanship. But mediæval princes and bishops could obtain neither, except at great cost and trouble; to economize these, therefore, great skill and attention were required. It was necessary to study to avoid those large and expensive materials of which the Romans were so lavish, and to adopt the simplest and easiest forms of construction.

The first vaults tried were simple semicircular tunnel-vaults. It was found that these, besides being very gloomy, required very massive walls to resist their thrust. An attempt was then made to relieve this thrust by *transverse arches* (*a, a*, fig. 2) thrown across—at intervals—under the tunnel-vault, to act as strengthening arches. Buttresses with a slight projection were applied outside to support these, and a beam of wood was sometimes introduced at the wall-head from buttress to buttress to assist in opposing the thrust of the vault. This was the first attempt to throw the weight of the vault on single points. In the aisles, where the span was small, the Roman intersecting vaults (*b, b*, fig. 2) were used; and as the roofs with tunnel-vaulting were



Fig. 2.

found very gloomy and ill-lighted, it was desirable that similar intersecting vaults should be used to cover the main roof, in order to admit windows raised to light the vaulting. But how was this to be managed with the small materials at command? If the transverse arches *AB*, *CD* (fig. 3) are semicircular, and the side-arches *AC*, *BD* the same—the vault being formed by two intersecting cylinders—then the

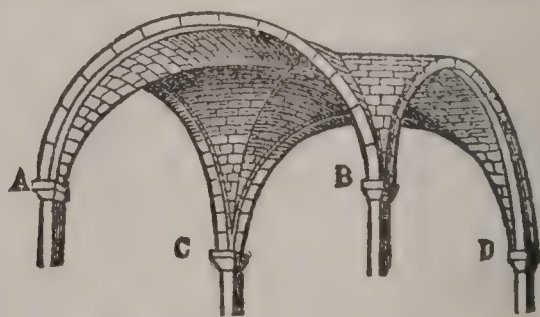


Fig. 3.

intersecting groins *AD* and *CB* must be elliptical. This was a difficult form of construction: the mediæval builders found it easier to construct semicircular groin arches with radius *EA* (fig. 4), and to fill in the triangular spaces *ABE*, etc., with slightly domed vaults. Here, then, we have the origin of the groin-rib, the development of which formed so important a part in Gothic vaulting. When the space to be covered was square, this form of vault was found satisfactory, and usually included two bays of the side-aisles,

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But this arrangement looked awkward externally, the windows of the clerestory not grouping well with those of the aisles. A transverse arch (*a, a*, fig. 4) was then introduced,

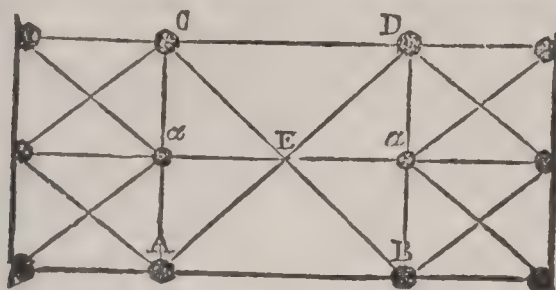


Fig. 4.

carrying up the design from the nave piers to the vaulting. This form of vault is called hexapartite. All the above forms of vaulting were fully developed in the round arched styles of the Rhine.

In France, also, these forms were tried; but it was found that the semicircle is not a good form of arch unless loaded on the haunches, many of the churches which were vaulted in this manner during the 11th c. having to be buttressed or

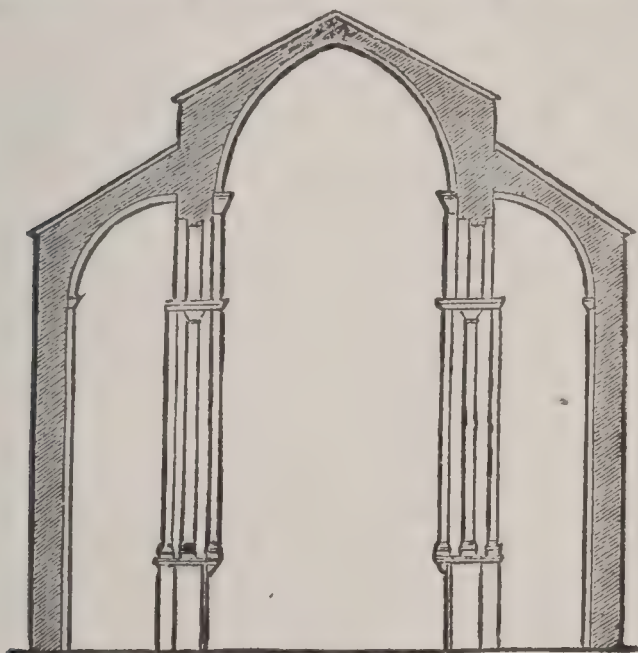


Fig. 5.

rebuilt in the 12th and 13th c. In s. France (where the Byzantine influence had been strongly felt, through the Mediterranean commerce), the pointed tunnel-vault (fig. 5) had been long in use, and had superseded the semicircular tunnel-vault probably as early as the 9th or 10th c. This form of arch was thus probably suggested to the architects of n. France, who at once saw how well it would overcome the difficulty of the yielding of the haunches in the semicircular arch. They were thus led to the adoption of the pointed form for their transverse arches as a *structural expedient*, and still retained the semicircular form in the groins. The next question which engaged attention, and the solution of which led to the further use of the point,

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arch, was the vaulting of oblong spaces. This had been tried with semicircular arches, but it was found that in this way the vault would require to be very much domed—the diameter of the arches (c, c , fig. 2) being so much smaller than that of $a a$ —whereas by using pointed arches, of different radii, for the transverse and side arches all might be kept at about the same height (figs. 6 and 7). This is more

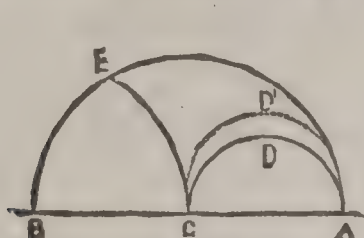


Fig. 6.

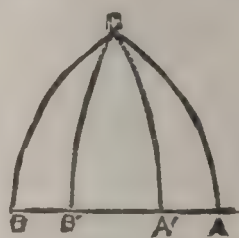


Fig. 7.

fully explained by fig. 6. If AB be the diameter of the transverse arch (aa), and AC that of the side arches (cc), it is clear that the semicircular side arch ADC cannot reach the height of the transverse arch AEB , even when stilted as at D' . But in the pointed arch, CEB , the same diameter rises to very nearly the height of the transverse arch. The pointed arches ACB and $A'CB'$ (fig. 7) show how easily arches of this form, whatever their diameter, can be built of the same height. By the introduction of this new form of arch the vaulting was strengthened, and the thrust brought to bear steadily on single points. Thus may be traced the history of vaulting from the time of the Romans to the 12th c., when the principles of Gothic pointed vaulting were fully developed; and we have dwelt particularly on this subject, because it includes the principles which regulated the whole of the Gothic style. $G. A.$ was not the invention of an individual, but a necessary growth—a gradual development from structural requirement. This is clearly the case with regard to the vaulting, as we have traced it above, and the same might be proved regarding every member of the style. Thus it might be shown how the ribs became gradually more decided, expressing the part that they bore in the support of the roof; how the nave piers (*q.v.*) were gradually subdivided into parts, each shaft bearing on a separate cap a separate portion of the vaulting; how the buttresses were developed as they were required to resist the thrust of the groins concentrated on points; and how the flying buttresses were forced on the Gothic architects much against their will, as a mode of supporting the arches of the roof.

The history of the flying buttress is curious. The thrust of the tunnel-vault was sometimes resisted by half tunnel-vaults over the side-aisles (see fig. 5). These, therefore, required to be high, and a gallery was usually introduced. In the Narthex at Vezelay (fig. 8) we have this gallery with the vaulting used as a counterpoise to that of the nave. This is a fine specimen of vaulting in the transition state, the vaulting of the gallery resists the main vault, as in fig. 5, and is at the same time groined. This leaves a somewhat weak point opposite the transverse arches, and to strengthen

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such points, flying buttresses are introduced, which timidly show themselves above the roof. The galleries were, in later instances, dispensed with to admit of larger clerestory

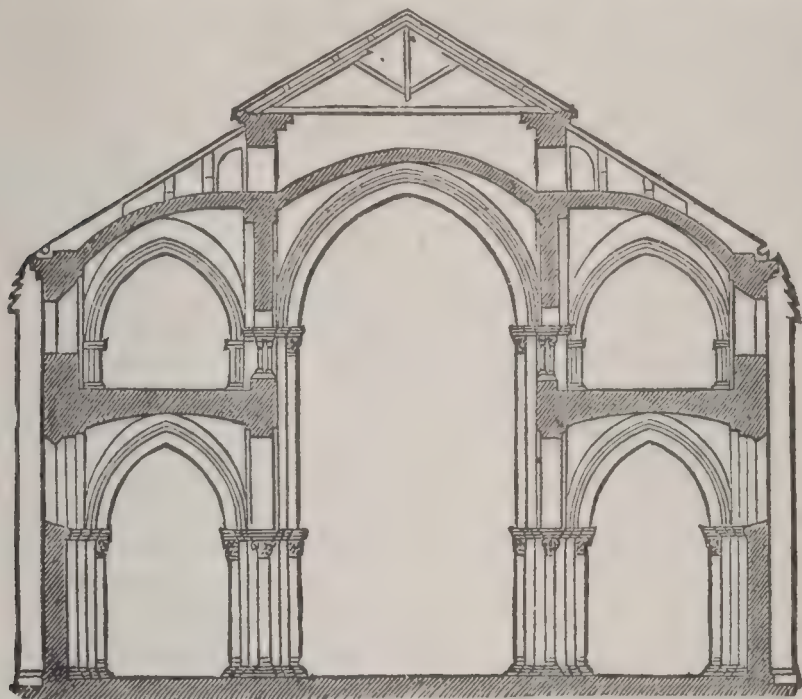


Fig. 8.

windows, and the flying buttresses were left standing free. The architects finding them indispensable, then turned their attention to render them ornamental. *Pinnacles* may also be shown to owe their origin to their use; they acted as weights to steady the buttresses and piers. Under the separate heads it will be shown how each element of Gothic architecture was in the strictest sense constructional, the decoration being in harmony with its actual use, or as Pugin has said, 'decorated construction not constructed decoration.'

The full development of Gothic vaulting, the forerunner of the whole style, was first carried out in the royal domain in France about the middle of the 12th c. The Normans had settled in n. France more than a century before this, and had applied their talents and the fruit of their conquests to the building of splendid temples in honor of their victories. In doing so, they followed out the round-arched style, and brought it forward by a great stride toward true Gothic: see NORMAN ARCHITECTURE. South of the royal domain, in Burgundy, there had existed for centuries great establishments of monks, famous for their architecture. The Abbey of Cluny was their central seat, whence they sent out colonies, and built abbeys after the model of the parent one. The style in which they worked was also an advanced Romanesque, but different from that of the Normans. Between these two provinces lay the royal domain. Owing to the weak state of the kingdom, architecture had hitherto made little progress in the isle of France. About the beginning of the 12th c. the monarchy revived, and for the next two centuries was governed by wise and powerful monarchs, who succeeded in re-establishing the royal su-

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premacv. A new impulse was thus given to the literature and arts of the country, by which architecture profited largely. From the state of ruin into which the kingdom had fallen, there were almost no churches existing worthy of the new state of things. New and great designs were formed: hitherto, almost all the important churches of France were abbey churches; now, under the royal patronage, cathedrals were to be built. The bishops, envious of the power of the monks, lent their powerful aid, and the laity joined heartily in the work. With such a universal impulse, architecture took a great stride, and new forms were introduced. It is to this period and people that we owe the development of the true or pointed Gothic style.

We have already seen at Vezelay how nearly the Burgundian monks had approached to Gothic. To complete the development, it required only the side-walls and vaulting of the nave to be raised, so as to admit of windows over the roofs of the side-galleries; and the flying buttresses to be raised with them, so as to receive the thrust of the vault—the latter being constructed with pointed groin ribs, and the side and transverse arches carried to the height of the groins. The laic architects of the royal domain soon accomplished this step, and the new style sprang up and advanced with astonishing rapidity. The earliest example that we have of the fully developed Gothic style is the cathedral of St. Denis, in which are deposited the remains of the kings of France. It was founded by the Abbé Suger 1144. The cathedral of Notre Dame of Paris soon followed and almost contemporary with it arose the magnificent cathedrals of Chartres, Rheims, Amiens, Beauvais, Bourges, and many others.

Another cause which tended to hasten the progress of the style, was the invention about the same time of painted glass. The Romanesque architects had been in the habit of decorating their churches with frescoes and other paintings; but this new mode of introducing the most brilliant colors into their designs was at once seized on by the northern architects. The small circular-arched windows, which were still in many instances retained long after the pointed-arch had become usual in the vaulting, no longer when filled with stained glass, sufficed to light the churches. They were therefore enlarged, two or even three were thrown into one, divided only by mullions; this compound window was again increased until the compartment of the clerestory became almost wholly absorbed. The architects were then forced to conform the arches of their windows to the pointed outline of the side-arches of the vaulting. The desire for more and more space for stained glass was the origin of the window-tracery, which forms so beautiful a feature of the style. It is the last attenuated remainder of the wall space of the clerestory, which was at last entirely absorbed.

Fig. 9, from Notre Dame, is a good illustration of the progress of French G. A. The left-hand portion of the elevation shows the mode of fenestration adopted. The clerestory windows are small; and, in order to give more

GOTHIC ARCHITECTURE.

light, the vault of the gallery next the window is kept very high. This was the original design; but during the construction of the cathedral, the importance of stained glass had become so great, that the design was altered to give larger windows for its display, as shown on the right-hand portion of the elevation. These windows also show the simple early forms of tracery; that in the aisle windows being later and more advanced. Fig. 10 shows two bays from Tournay cathedral, and is a good specimen of the

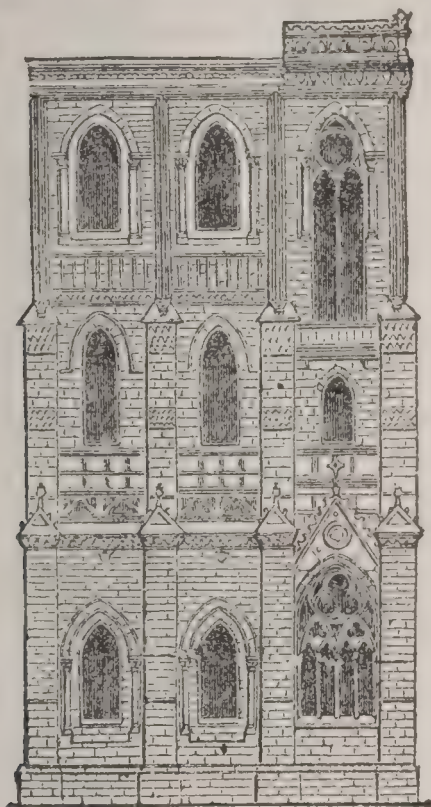


Fig. 9.



Fig. 10.

mode in which the whole space of the side-walls was made available for window tracery and stained glass.

The further history of G. A. in France is simply the following out, to their furthest limits, of the principles above indicated, on which the early architects had unconsciously been working when they originated the style. So long as the Gothic architects worked on these principals, they advanced and improved their architecture. When, however, the style had become fully developed and matured (about 1300), the spirit of progress died. No new features were developed. The architects seemed to think that in its main elements their style was complete, and contented themselves with continuing the traditional style of their forerunners, pushing to extreme limits the principals handed down to them. Thus, the height of the cathedrals was extended till, at Beauvais, it exceeded the power of the architects to prop up the vaulting. The system of buttresses and pinnacles was developed with the utmost skill. till at last the original simplicity and repose of the designs were lost, and the exteriors presented an elaborate system of scaffolding and propping-up in stone. The beautiful forms of the early tracery became distorted into all manner of flowing

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curves, graceful but unmeaning, of the Flamboyant period (q.v.); and, in short, the art became lost in mere cleverness of design and dexterity of execution, and the architect's place was usurped by the freemason. It is in the cathedrals of the 12th and 13th c., above referred to, that we find the noblest development of the Gothic style. Everything tended to make them so. The nation was united in the effort—all the science, all the arts, all the learning of the times were centered in the church. In it, and that almost exclusively, the sculptor, the painter, the historian, the moralist, and the divine, all found scope for the expression of their ideas on the sculptured walls, porches, and niches, or the painted windows of the cathedrals—the churches of the people.

The progress of this style in other countries is no less remarkable. At no time in the world's history did any style of architecture ever spread so wide, or give rise, in so short a time, to so many splendid buildings. No sooner had the style been invented in central France, than it immediately spread over the whole of w. Europe, superseding all other styles, and everywhere producing similar splendid buildings wherever it went. In England, Germany, and Italy, the Gothic style had some peculiarities. It spread also over s. France, and Spain; but the latter countries have not yet been fully illustrated.

English Gothic.—The Normans introduced their round-arched style at the Conquest 1066, and there are some fine specimens of this style in England and Scotland—St. Cross, Hampshire; Durham cathedral; Kelso and Jedburgh abbeys, etc. But these buildings are not copies of those of Normandy. The English have always, in adopting styles, given them a national impress. As it was with the Norman, so to a still greater degree with the pointed Gothic. This was introduced into England about 1174, by William of Sens, who superintended the rebuilding of Canterbury Cathedral. The English architects soon began to develop a pointed style of their own. They borrowed much from France, and worked it out in their own way, forming what is now called the *Early English* style. The differences between the early Gothic of France and England extend to almost every detail. The moldings, bases, caps, pinnacles, buttresses, and foliage of the latter all are impressed with the early English feeling. In France, the feeling of the early Gothic is one of unrest—a constant struggle forward. In England, the effort for progress is not so marked—that of carefulness and completeness prevails. In the *plans* of the cathedrals the differences are marked (see figs. 11, 12), as the accompanying plans of the cathedrals of Salisbury and Amiens show. The termination of a French cathedral or church is invariably circular ended or apsidal—a form derived from the circular tomb-house or baptistry, which in early Christian times was built separately, and afterward taken into the cathedral. The English cathedral, on the contrary, is almost always square ended. The French transepts have almost no projection; the English ones have

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great projections—Salisbury and Canterbury having *two* transepts. The French cathedrals are short and very lofty; the English, long and comparatively low. The French

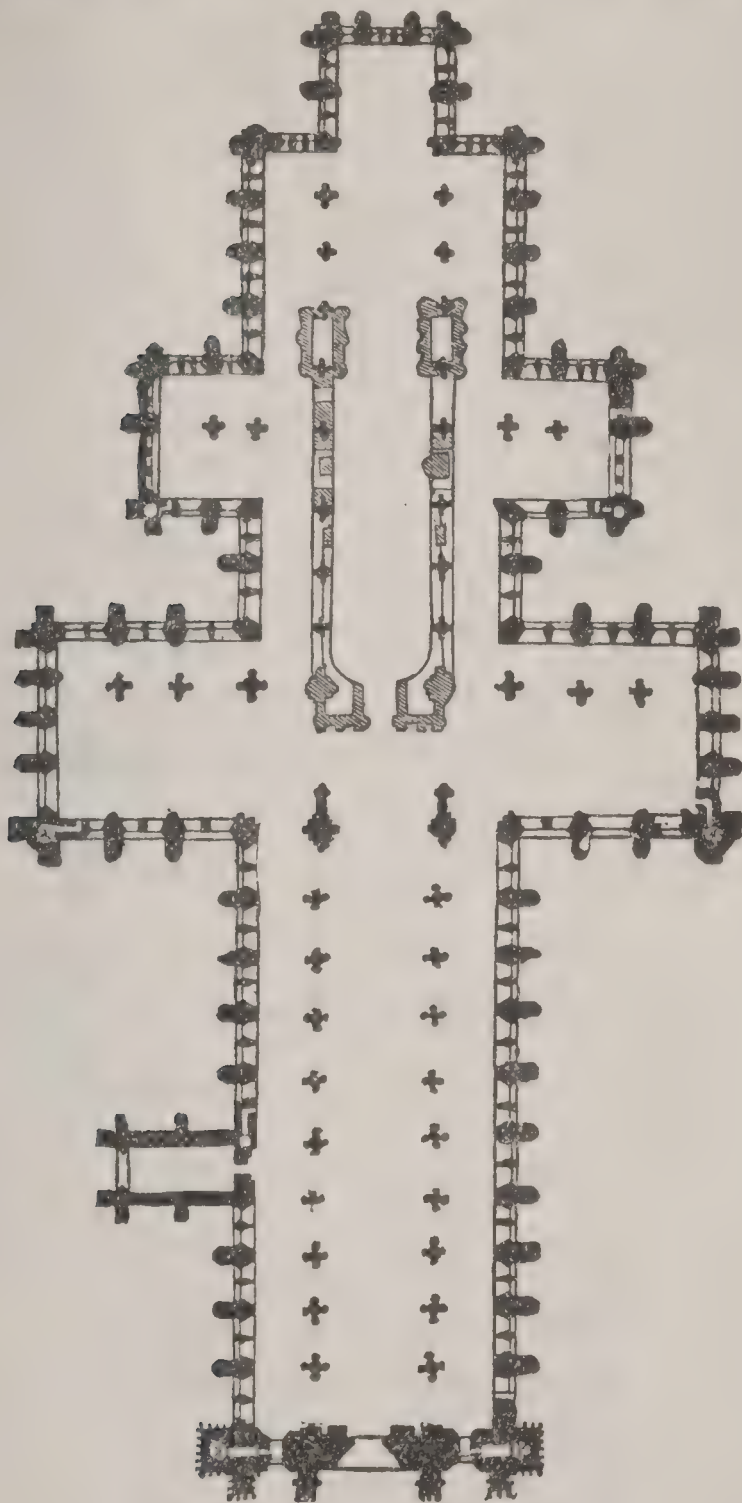


Fig. 11.—Salisbury Cathedral.

buildings are perhaps the grandest and most aspiring, the English the most finished and picturesque. The exterior of the chevet was a difficulty with the French and Germans, and, as at Beauvais and Cologne, resembles an intricate and confused mass of scaffolding. This difficulty was avoided by the English square ends, which afforded scope for the very English arrangement of the 'Five Sisters' at York, or for a large field of stained glass in a single window. The

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western portals of the French cathedrals, such as Rheims and Amiens, are among the boldest and most magnificent features of their architecture. In these the English were not far behind, as the western portals of Peterborough and York show. The outlines of the English cathedrals are usually very picturesque and well balanced, the western towers grouping harmoniously with the central, and in this respect the English have the advantage.

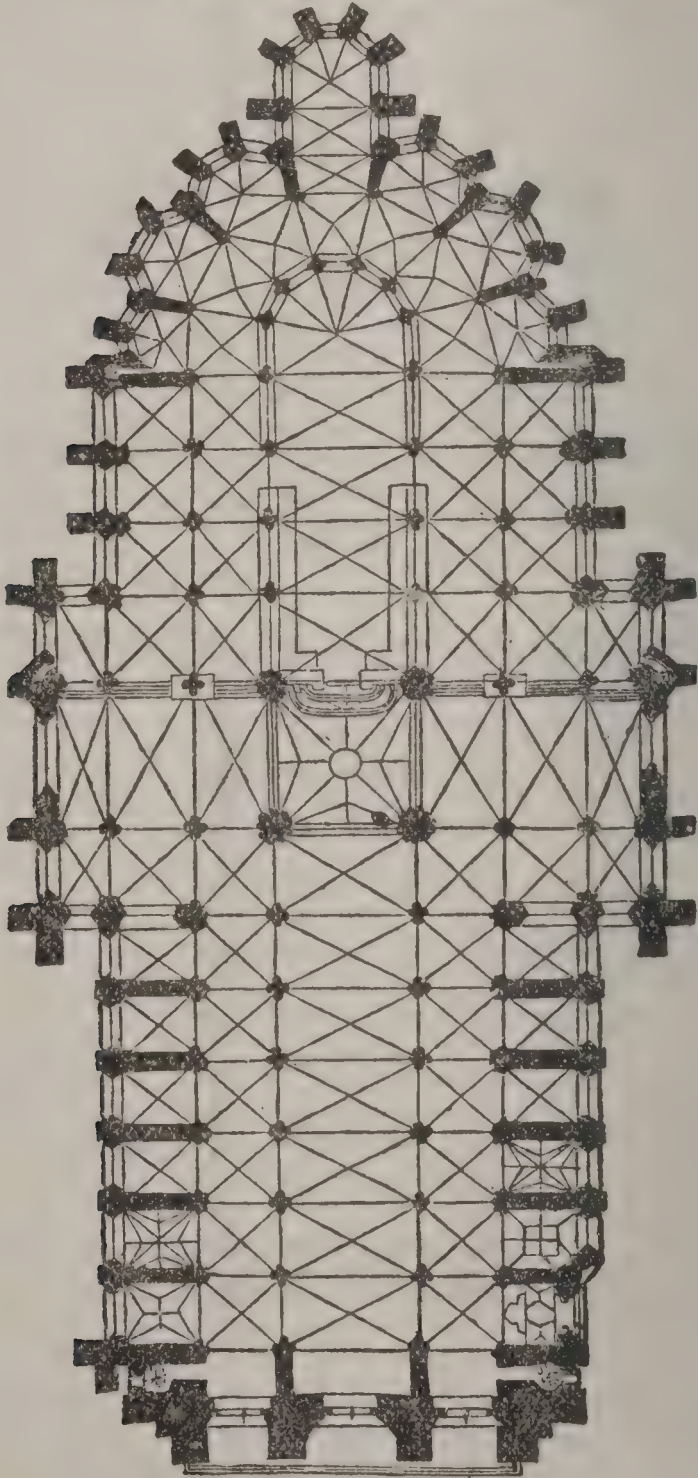


Fig. 12.—Amiens Cathedral.

In the application of vaulting, the English carried out their own ideas. They always inclined to prefer wooden roofs; probably this led to the invention of the many beautiful kinds of vaults which form so fine a feature of Eng-

lish Gothic (see VAULTING: FAN-TRACERY). In England the style lasted longer than on the continent.

The Germans were nearly a century in adopting the pointed style after its invention in France; and when it was introduced, it retained the appearance of a foreign importation. It never was so completely naturalized as in England. The so-called beauties of the German Gothic are, for the most part, to be regarded rather as excellent specimens of masonry than as artistic developments of the style. The open-work spires, for example, are fine pieces of construction, and have a striking effect; but from the first there is a tendency to commit the work to masons, who rejoice in displaying their manual dexterity. The later Gothic in Germany is the most splendid development

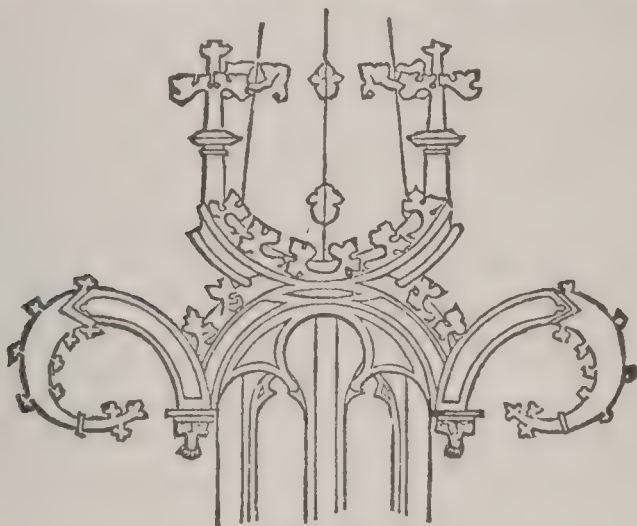


Fig. 13.

of the stone-cutter's art and the draughtsman's ingenuity; these run riot, while the artist is entirely awanting. The distortions of fig. 13 may serve as an example.

The Gothic style forced its way also into classic Italy, but there it was never understood nor practiced in its true spirit. It was evidently from the beginning an imitation. The Italian architects tried to vie with those of the north in the size of their buildings, some of which, as San Petronio at Bologna, and Milan Cathedral, are enormous. The former illustrates the defects of Italian Gothic. The arches are very wide, and there are few piers. There is therefore a bare and naked effect, not compensated for by any richness of sculpture or color. There is a want of *scale* about Italian Gothic buildings, as there is about those of Italian classic architecture, both ancient and modern. Size alone is depended on for producing grandeur of effect. There is no attempt made to mark the size, and give a scale by which to judge of the dimensions of the buildings in those styles. A large classic temple is simply a small one magnified. In true G. A. the case is different. Not only are the general dimensions magnified in a large edifice, but also the parts are multiplied. The columns and shafts remain of the same size, but their number is increased. The arches are enlarged in proportion to the general dimensions, but the caps, bases, and moldings re-

GOTHIC LANGUAGE—GOTHLAND.

main of the same size as in a smaller building, and thus indicate the greater size of the arch. A true Gothic building of large dimensions thus tells its own greatness; but in a classic or Italian Gothic edifice the size has to be found out. Stained glass was little used in Italy. It may have been intended to decorate the walls with frescoes—as indeed is the case in a few instances. The church of St. Francis, at Assisi, is the most remarkable building of this kind, and is a most interesting example of fresco-decoration.

The towns of Italy, being early enfranchised, have many municipal buildings in the Gothic style. For these, with those of Belgium, see MUNICIPAL ARCHITECTURE.

We might, in the same manner, trace the Gothic style in all the other countries of w. Europe; but its history is similar in all. It is in England and France that the true spirit of the style was most felt, and the finest examples remain. For the more important of the various styles of G. A. in different countries, see EARLY ENGLISH: DECORATED: PERPENDICULAR: FLAMBOYANT.

In general both in France and England the style had a complete existence—it was born, arrived at maturity, and died. When the spirit of the early architects had pushed the design to its utmost limits, they rested from their labors, satisfied with their splendid achievements. Their successors occupied themselves with forms and details, and with the perfecting of every minute part. The art finally passed away, and left architecture in the hands of trade corporations—masons, carpenters, plumbers, etc.—who monopolized the whole work, and acted independently to the exclusion of one directing mind. The result was as we have seen: architecture became masonic skill, and G. A. was finally superseded by the revival of classic architecture in the 16th century.

GOTHIC LANGUAGE: language of the Gothic nation, including the idioms of their various divisions; known only by fragments of a translation of the Bible, and other manuscripts, supposed to date from the 5th c. See GOTHS: ULFILA.

GOTHITE, n. *gêth'it*: see GOETHITE.

GOTHLAND, *gôth'land* (Swed. *Götland*): island in the Baltic, between 57°—58° n. lat., and 18°—19° 30' e. long., which, with Faröe, Gotska, Sandöe, and other smaller islands, constitutes the Swedish län or province of Gotland or Wisby; abt. 1,200 sq. m.; pop. (1891) 51,337. Chief town, Wisby (q.v.). G. consists mainly of terrace-like slopes of limestone formation, encircled by cliffs broken by numerous deep fiords, especially on the w. coasts of the island, the e. parts of which are flat. The surface is in many parts hilly and well wooded, and the soil is fruitful and well cultivated. The climate is sufficiently mild to allow of the grape and mulberry ripening in favorable situations in the open air. The land is divided among many small proprietors, who live in separate homesteads. The island of G. was for ten years

GOTHOFRED.

(1439-49) the self-elected place of banishment of King Eric X., who, after long-continued dissensions with his Swedish and Danish subjects, retired to Wisby, where he shut himself up in the castle with his favorite mistress and a band of followers. Having refused to resume his duties, he was declared to have forfeited the crowns of Sweden and Denmark, and thenceforward he subsisted by pillaging the ships and infesting the coasts of the lands that he had formerly governed. The remains of numerous churches and monasteries in every part of the island attest its former wealth, and afford many noble specimens of Gothic architecture.—The name G. or Gotland (q.v.) is used to indicate also the southern division of the kingdom of Sweden, including 11 provinces besides the island of Gothland.

GOTHOFRED, *gōth'o-frēd* (or GODEFROY, *god-frwā'*) DENIS: 1549-1622; b. Paris: lawyer. He was educated in the universities of Louvain, Heidelberg, and Cologne; and returning to Paris was appointed a parliamentary counselor. In 1580 he became prof. of Roman law in the Univ. of Geneva, and subsequently in Strasburg and Altorf. In 1600 Frederick, elector palatine, appointed him prof. in the Univ. of Heidelberg, where he remained at the head of the faculty of law, in spite of flattering offers from other universities, till the invasion of the palatinate forced him to take refuge in Strasburg where he died. He was considered one of the first jurists of his time, and published a famous *Corpus Juris Civilis* (1583) and other legal works.—His eldest son THEODORE G. (1580-1649; b. Geneva), became historiographer of France 1632, held several diplomatic posts, published numerous works on genealogy, *Le Cérémonial de France* (1619), and *The True Origin of the House of Austria* (1624).

GOTHOFRED (or GODEFROY, *god-frwā'*), JACQUES: lawyer: 1587-1652; b. Geneva; son of DENIS G. He became prof. of law in Geneva Univ., sec. of state, and principal magistrate of the republic, and was employed in several important missions to the court of France. He published numerous works on Roman law, collected and arranged the fragments of the *Twelve Tables*, and achieved enduring fame by his *Codex Theodosianus* (1665), on which he was engaged 30 years.

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GOTHS [Lat. *Gothi*, *Gothones*, *Guttones*, *Gutæ*, etc.; Gr. *Gotthoi*, *Gottoi*, *Goutthoi*, *Guthōnes*; Gothic, *Gutthiuda*]: powerful nation of antiquity, belonging to the Germanic race. By some writers they are thought to have had a Scandinavian origin, which was the belief of their own historian, Jornandes. Indeed, Jornandes, Procopius, Capitolinus, and Trebellius Pollio identified them with the Getæ, a branch of the Thracian group of nations; but later researches, especially those of Dr. Latham, leave it almost without a doubt that the G. were originally Germans. The earliest notice of them extant among the writers of antiquity is that of Pytheas of Marseille, who lived about the time of Alexander the Great (B.C. 356–323) and wrote a book of travels, some fragments of which have been preserved in the works of other writers. In one of these fragments, we find mention of a tribe of *Guttones* bordering on the Germans, and who lived round a gulf of the sea called Mentonomon, a day's sail from the island of Abalus, where they used to gather amber, and sell it to the neighboring Teutones. This gulf, there is every reason to believe, was the *Frisches Haff*, on the Prussian shore of the Baltic. The next notice that occurs of the G. is in the *Germania* of Tacitus, in which they are called Gothones, and are represented as dwelling beyond the Lygii; in the same direction, that is, as the one pointed out by Pytheas, though not on the sea-coast. Tacitus also distinguishes them from the Gothini, a tribe e. of the Quadi and Marcomanni, and who are represented by him as using the Gallican tongue. The Gothones, according to this historian, were under regal government, and on that account not quite so free as the other tribes of Germany, yet with considerable liberty. The tribes next beyond them and dwelling immediately on the sea-coast, were the Rugii and Lemovii, whose form of government was also monarchical, and their weapons, like those of the Gothones, round shields and short swords.

We hear of the G. next as settled on the coast of the Black Sea, about the mouths of the Danube, early in the 3d c. But at what time, or under what circumstances, their migration from the Baltic to the Euxine took place, it is impossible to ascertain. 'Either a pestilence or a famine,' says Gibbon, 'a victory or a defeat, an oracle of the gods or the eloquence of a daring leader, were sufficient to impel the Gothic arms on the milder climate of the south.' In their new home, which was also the country of the Getæ (whence, perhaps, the error that confounded them with that people), the G. increased both in numbers and strength, so that, as early as the reign of Alexander Severus (A.D. 222–235), they made some formidable inroads upon the Roman province of Dacia. In the reign of Philip (244–249), they ravaged that province, and even advanced to the siege of Marcianopolis in *Mæsia Secunda*. The inhabitants ransomed their lives and property by a large sum of money, and the invaders withdrew for a time to their own country. In the reign of Decius they again entered Mæsia to the number of about 70,000, led by a king named

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Cniva. Decius himself advanced to meet them, and found them besieging Nicopolis. On his approach, they raised the siege, and marched away to Philippopolis, a city of Thrace, near the foot of Mount Hamus. Decius pursued them by forced marches; but at a convenient opportunity the G. turned with unexampled fury upon the Roman legions, and utterly defeated them. Philippopolis next fell before them by storm, after a long resistance, during which, and the massacre that followed, 100,000 of its inhabitants are reported to have been slain. This was in 250. In the following year another tremendous battle took place near an obscure town called Forum Trebonii, in Mœsia, in which the Romans were again defeated with great slaughter, Emperor Decius and his son being among the slain. The succeeding emperor, Gallus, purchased their retreat by an immediate present of a large sum of money, and the promise of an annual tribute for the future. The G. now set themselves to the acquisition of a fleet, and with this, 253, advanced to the conquest of Pityus, a Greek town on the n.e. coast of the Black Sea, which they completely destroyed. In 258 they besieged and took Trebizond, when a great fleet of ships that were in the port fell into their hands. In these, they deposited the booty of the city, which was of immense value; chained the robust youth of the sea-coast to their oars; and returned in triumph to the kingdom of Bosphorus. In the following year, with a still more powerful force of men and ships, they took Chalcedon, Nicomedia, Nice, Prusa, Apauræa, and Cius. In a third expedition, which numbered as many as 500 vessels, they took Cyzicus, then sailed down the Ægean, ravaged the coast of Attica, and in 262 anchored at the Piræus. Athens was now taken and plundered, and many other renowned places in Greece were either partially or wholly destroyed. Even Italy was threatened; but, says Gibbon, 'the approach of such imminent danger awakened the indolent Gallienus from his dream of pleasure.' The emperor appeared in arms; and his presence seems to have checked the ardor, and to have divided the strength of the enemy. A portion of the G. now returned to their own country. But in 269 they again started on a maritime expedition in far greater numbers than ever. After ravaging the coasts of Europe and Asia, the main armament at length anchored before Thessalonica. In Claudius, successor of Gallienus, however, the G. found a far abler general than any they had yet contended with. This emperor defeated their immense host, said to number as many as 320,000 men, in three successive battles, taking or sinking their fleet, and after an immense slaughter of their troops, pursuing such as escaped until they were hemmed in by the passes of Mount Hamus, where they perished for the most part by famine. This, however, was only a single reverse. Aurelian, successor of Claudius, was obliged to cede to them, 272, the large province of Dacia, after which there was comparative peace between the combatants for about 50 years. In the reign of Constantine, their king, Araric, again provoked hostility, but was obliged eventu-

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ally to sue for peace with the master of the Roman empire. In the reign of Valens, they once more encountered the Roman legions, with whom they carried on a war for about three years (367-369) with some success. They now began to be distinguished by the appellations of Ostro-Goths and Visi-Goths, or the G. of the east and west; the former inhabiting the shores of the Black Sea, and the latter, the Dacian province and the banks of the Danube. On the irruption of the Huns, the Visigoths sought the protection of Valens against those barbarians, and in 375 were allowed by him to pass into Mœsia, to the number of about 200,000. Great numbers of them also now took service in the Roman army; but a dispute soon arose between the G. and their new allies, which led to a decisive battle, 378, near Adrianople, in which Emperor Valens lost his life. The G. now threatened Constantinople, but were not able to take it; and during the reign of Theodosius, there was again comparative peace.

Henceforward, the history of the Visigoths and Ostrogoths flows in two divergent streams. Before tracing either of these, however, it should be noted that the G., for the most part, became converts to Christianity about the middle of the 4th c., adopting the Arian form of belief, in accordance with the instructions of their renowned teacher and apostle, Bishop Ulfilas. The term Mœso-Goths was applied to certain of the western G., who having settled in Mœsia, there devoted themselves to agricultural pursuit, under the protection of the Roman emperors.

Visigoths.—Upon the death of Theodosius the Great, 395, and the partition of the empire between Honorius and Arcadius, the renowned Alaric, King of the Visigoths, sought the command of the armies of the eastern empire, and upon being refused, invaded Greece with an army of his countrymen. About 400, he invaded Italy, took and pillaged Rome (410), and was preparing to carry his arms into Sicily and Africa, when his career was arrested by death: see ALARIC. Alaric was succeeded in the sovereignty by Athaulf (reigned 410-415), who, having married Placidia, the sister of Honorius, withdrew from Italy into the south of Gaul, and about 412 crossed the Pyrenees into Spain. Athaulf was assassinated at Barcelona, and his successor, Sigeric, dying the same year, the choice of the G. now fell on Wallia (415-418), who extended his power over a great part of southern Gaul and Spain, and made Toulouse his capital. The G., under this monarch, greatly assisted the Romans in their contests with the Vandals and the Alani. Wallia was succeeded by Theodoric I. (418-451), son of the great Alaric. He lost his life in the bloody engagement of Châlons-sur-Marne, leaving the throne to his son Thorismund (451-452), who, however, was assassinated by his brother Theodoric II. (452-466), who reigned for some years, but was at length himself assassinated by his brother Euric (466-483), whose reign was unusually brilliant and successful. He extended the sovereignty of the Visigoths considerably both in France and Spain, introduced the arts of civilization among his subjects, and compiled for their

use a code of laws, in which were embodied many sound principles of jurisprudence. Under his successors, Alaric II. (483-506) and Amalaric (506-531), however, the kingdom of the Visigoths declined before that of the Franks. Alaric II. fell by the hand of Clovis in battle 507, and Amalaric was killed either in battle or by an assassin 531. Under his successor Theudes, the rule of the Visigoths was confined exclusively to Spain. Theudes was in his turn assassinated in his palace at Barcelona 548. It will not be necessary to trace the long line of Visigothic kings that subsequently ruled in Spain 548-711. The Visigothic power was completely broken, and their last king, Rodrigo or Roderick, slain by the Saracen invaders on the battlefield of Xeres de la Frontera.

Ostrogoths.—At the time when the Visigoths were admitted by Valens within the boundaries of the Roman empire, the same favor was solicited by the Ostrogoths, but was refused them by that emperor. They revenged themselves for this slight or injury by making frequent incursions into the Roman territories, sometimes on their own account, and sometimes as the allies of the Visigoths. In 386, the Ostrogoths sustained a severe defeat under their king or general, Alatheus, in attempting to cross the Danube, when many thousands of them perished, either by the sword of the Romans, or in the waves of the river. After this, they obtained a settlement in Phrygia and Lydia, but were ever ready to aid any fresh band of barbarians that prepared to assault the empire. Thus, they joined Attila in his renowned expedition against Gaul (450-453), and fell by thousands under the swords of their kinsmen the Visigoths at the battle of Châlons-sur-Marne. After this, they obtained a settlement in Pannonia, whence they pressed upon the eastern empire with such effect, that the sovereigns of Constantinople were glad to purchase their forbearance by large presents of money. In 475, Theodoric, greatest of the Ostrogoth sovereigns, succeeded to the throne upon the death of his father Theodemir. He directed his arms almost immediately against the eastern emperor Zeno; and having gained considerable advantages over him, obtained a grant of some of the richest provinces in the empire. Eventually, he was named chief of the imperial guard, and indeed consul for the year 484. In 488, with the consent and advice of Zeno, he planned an immense expedition against Odoacer, King of Italy, who had held that title since 476, when he dethroned Augustulus, last of the western emperors. Theodoric utterly defeated Odoacer, slew him, it is said, with his own hand, and reigned undisturbed sovereign of Italy until his death 526. The seat of his empire was at Ravenna, which he sometimes exchanged for Verona, and once—in 500—he visited Rome, when he convened a meeting of the senate, and declared that it was his intention to rule the people committed to his charge with even-handed justice. To a great extent, he fulfilled this promise, and governed his subjects on the whole wisely and to their advantage. The glory of his reign was, however, sullied by the putting to death of two of the most distinguished men

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of that age, Boethius and Symmachus, upon the plea that they were engaged in a conspiracy against him. During his reign, the Ostrogoth kingdom included, besides Italy, all the adjoining countries within the Rhone and the Danube; also the modern Bosnia, Servia, Transylvania, and Wallachia. In the disorders consequent on the death of Theodoric, Emperor Justinian sought to win back Italy to the allegiance of the emperors of Constantinople; and for this purpose he despatched Belisarius at the head of an army into that country. In 536, Belisarius entered Rome, which he held for his master, though invited by the G. to become himself their king; but all his and his successor's efforts to subdue the G. were at that time utterly fruitless. Totila (541-552), a noble Goth was elected as successor to Vitiges, antagonist of Belisarius, but was conquered in the battle of Tagina, by the imperial general, Narses, 552. In that battle, Totila received his death-wound, and was succeeded by Teias, who did all that a brave man could to repair the misfortunes of his countrymen. It was to no effect, however, for he also was killed in battle in the following year, when 'his head,' says Gibbon, 'exalted on a spear, proclaimed to the nations that the Gothic kingdom was no more.' The Ostrogoths, broken and dispersed by their calamities, henceforward disappear from history as a distinct nation, their throne in Italy being filled by the exarchs of Ravenna; while the nation generally became absorbed in the indiscriminate mass of Alani, Huns, Vandals, Burgundians, and Franks, who had from time to time established themselves in the dominions of the old Roman empire.

GOTLAND, *göt land* (*Götaland*, or *Götarike*): most southern of the three old provinces or main divisions of Sweden. (q.v.). G. is now divided into 12 län or departments; total area about 37,000 sq. m. or one-fifth of all Sweden; pop. more than 2,500,000. The greater part of the region especially in the north and interior, is covered with mountains, forests, and lakes; but its s. districts contain some of the most fertile land in Sweden. The principal lakes are the Wener (q.v.), and the Wetter (q.v.). The river Göta, which was unfit for navigation on account of its cataracts—the most picturesque of which is Trollhättan—has been rendered navigable by the construction of numerous locks and canals, and is now open to vessels of considerable burden from Gottenborg, on the Cattegat, to Lake Wener, whence the Göta canal extends the line (of 260 m.) of internal communication across the kingdom to its e. shores. G. comprises a large portion of the mining districts, and is especially rich in iron and alum, and yields good copper, nickel, coal, etc. The peasantry are superstitious, attached to their old traditional usages and their national costume, but are honest and industrious, hospitable and contented.

GOTTENBORG, *göt'en-borg*, or GOTHENBURG [Swed. *Göteborg*]: chief commercial town, and next to Stockholm, most important city of Sweden; lat. 57° 41' n., long. 11° 58' e.; principal town of the län of Gottenborg. G. was

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founded by Gustavus Adolphus 1618, is on the river Göta, a few miles from the Cattegat, and consists of a lower and upper town; the former intersected by numerous canals, which are bordered by *allées* of fine trees, and spanned by numerous bridges; and the latter picturesquely scattered over the adjacent rocky heights. Its admirable harbor, protected by three forts, affords safe anchorage to ships of heavy burden, and has long been noted for extensive foreign commerce. The upper parts of the town have wide and regular streets and good stone houses; but there are few buildings deserving of special notice except the new church, the exchange, the cathedral, the town hall, and arsenal. G. is the see of a bishop, and the seat of the gov. of the district. It has good schools, one of them founded by Oscar I. for the children of soldiers; a public library; an acad. of science and literature, incorporated 1775; etc. The Göta canal, which connects the German Ocean and the Baltic, brings G. into direct communication with Stockholm and a great portion of the interior of the kingdom, which it supplies with the products of foreign commerce and its own home-industry. The latter is of considerable importance, and includes, besides ship-building, extensive manufactories of woolen and cotton goods, sail-cloths, tobacco, snuff, glass, paper, sugar, and porter. About 2,000 vessels, of 500,000 tons, annually enter the port. The exports are iron, copper, deals, tar and pitch, alum, fish, etc.; and the imports, salt, cereals, wine, and articles of colonial trade. The great feature of the G. *Licensing System*, which has acquired some notoriety, is the elimination of private profit in the sale of spirits, by having the public-houses conducted by managers paid by salary, while the profits are paid into the town treasury. Pop. (1880) 76,401, exclu. of extensive environs; (1890) 104,657; (1900) 130,619.

GOTTFRIED VON STRASBURG, *gōt'frīt fon strās'búrg*, or GODFREY OF STRASBURG (Meister Gottfried of Strasburg), so called, it is believed, either from having been born, or from having resided in Strasburg in Alsace: latter part of the 12th and beginning of the 13th c.; died between 1210-20: one of the most eminent poets or minnesingers of the Middle High German period. His chief work, *Tristan*, in the composition of which he was employed at his death, and which extends to about 20,000 stanzas, was written about 1207, during the lifetime of Hartmann of Aue, whom he celebrates as the first of German narrators, and after the publication of the first portion of Wolfram von Eschenbach's *Parzival*, to the prologue to which he alludes. The morality of the poem, after the manner of that age, is not high; but in a merely literary view it is important in the history of European literature. Eilhart of Oberg had worked up the story of *Tristan* from a French poem. G. founds his story on another French poem (of which considerable fragments are extant), and names as the author Thomas of Brittany, who, however, is not to be confounded with the half or wholly fabulous Thomas of Ercildoune, referred to in the old English story of *Tristan*, published by Sir Walter Scott. Besides *Tristan*, some lyric poems by

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G. are extant. G.'s works, with later continuations of *Tristan*, were published by Von der Hagen (1823). An admirable edition of G. has been furnished by Bechstein (1869; 2d ed. 1873). Modern German translations have been given by Kurtz and Simrock. Wagner made use of *Tristan* for his opera *Tristan und Isolde*.

GOTTHELF, JEREMIAS: see BITZIUS, ALBERT.

GÖTTINGEN, *göt'ting-en*: town in the former kingdom of Hanover: lat. $51^{\circ} 31'$ n., long. $9^{\circ} 56'$ e.; one of the pleasantest in lower Germany; in a fruitful valley on both banks of an artificial arm of the Leine, called the New Leine, about 60 m. s. of Hanover. It is in general well built, but is almost destitute of fine edifices, and has an air of solitude, which even the number of students cannot dissipate. The *Rathhaus*, an old castellated and picturesque edifice; the educational institutions, of which there are many; the hospital, and the university, are the only buildings of any note. The univ. was instituted by George II., King of England and Elector of Hanover, 1734, and opened 1737, Sep. 17. Connected with it are the library, containing more than 500,000 vols. and 5,000 manuscripts; the Royal Soc., founded 1750, which publishes the well-known transactions and the *Göttinger Gelehrte Anzeigen*; the observatory; the art museum, with collections of old oil-paintings, of engravings, of coins and models of all sorts, and some casts from the antique; the lying-in hospital, the chemical laboratory; and the botanic gardens (laid out under Haller's superintendence 1739), one of the chief ornaments of the town. The number of students attending the univ. of G. (1822-26) averaged 1,481 annually; but in consequence of the troubles of 1831, the number in 1834 had fallen to 860. The univ. could, however, still boast a rare assemblage of distinguished teachers, such as Blumenbach, Dahlmann, Ewald, Gauss, Gervinus, Gieseler, Herbart, Lücke, Otrfr. Müller, the brothers Grimm, etc.; but the expulsion in 1837 of the 'seven professors,' Albrecht, Dahlmann, Ewald, Gervinus, the two Grimms, and W. Weber, for political reasons, inflicted a blow from which it has never fully recovered. It has more than 130 profess. of various grades: many are men celebrated throughout Europe. The number of students 1902, reached 1,371. The chief manufactures of the town are hosiery, leather, and musical and scientific instruments; but the only flourishing trade of G. is in the sale of tobacco and tobacco-pipes, books, and sausages. Pop. (1890) 23,689.

GOTTSCHALK, *got'shâlk*, or FULGENTIUS, *fül-jën'shî-ûs*: about 806-867, Oct. 30; b. Mentz, Germany: theologian. His father was a Saxon count, who placed him in the Benedictine monastery of Fulda at an early age. In 829 he wished to be released from his vows, and to return to the world, and after much trouble obtained the necessary dispensation from the synod; but through the hostility of the Abbot Raban (Hrabanus Maurus) the dispensation was afterward cancelled, and he was transferred to the monastery of Orbais, in Soissons. While there he made a

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special study of the writings of Augustine, and became a believer in the doctrine of absolute predestination, to condemnation as well as to salvation. His teachings met with great opposition; Notting (Nothingus), Bp. of Verona, reported him to his former abbot, then become abp. of Mentz, who summoned him before the council of Mentz 848, where in the presence of the emperor he defended his views, but was pronounced guilty of heresy and turned over to his superior, Hincmar of Rheims, for punishment. In 849 he again defended himself in an assembly at Chiersy, for which he was again condemned, whipped severely in the presence of the emperor and bishop, and imprisoned for life in the monastery of Hautvilliers. The brutal hostility of Raban followed him to the last, prevented Hincmar answering the summons of the pope to account for the harsh treatment, and led the superior to deny G. the consolations of the church in his last hours, as well as burial in consecrated ground.

GOTT'SCHALK, LOUIS MOREAU: 1829, May 18—1869, Dec. 18; b. New Orleans: pianist and composer. He began taking lessons on the piano and violin when 6 years old, and when 12 was sent to Paris, where he studied the piano with Hallé and Stamaty, and harmony with Maleden, beside having the friendship of Hector Berlioz. He made his first appearance in public in Paris in 1845, continued his study in musical composition 3 years longer, and then gave his first series of public concerts in Paris. 1848-53 he made professional tours through France, Spain, and Switzerland, and when he gave his first concert in the United States, Boston, 1853, Feb. 11, he had the prestige of a great European success. He gave concerts in the chief cities of the United States, Mexico, S. America and Australia, playing principally his own compositions, and while performing his *La Mort*, in a musical festival he had projected at Rio de Janeiro, was stricken with a fatal sickness.

GOTTSCHED, göt'shët, JOHANN CHRISTOPH: 1700, Feb. 2—1766, Dec. 12; b. Judithenkirch, near Königsberg, Prussia: German writer. At the age of 14 he entered the Univ. of Königsberg to study for the ministry, but he soon turned his attention to philosophy, the fine arts, and languages. In 1724, he removed to Leipsic, where 1730 he became extraordinary prof. of philosophy and poetry, and 1734 prof. of logic and metaphysics. G. endeavored to make the German language the vehicle of instruction for his countrymen in literature and science. In other respects, he was essentially French; and he valued elegance, precision, and purity of style. G. executed a multitude of poems, critical and philosophical works, translations, etc. His tragedy, *Der Sterbende Cato* ('The Dying Cato'), formerly very popular, is now regarded merely as a specimen of 'correct' and watery verse: see BODMER.

GOUDA, gow'dü (Dutch, *Ter Gouwe*): town of Holland, province of S. Holland, on the right bank of the Hollandsche Yssel, where it is joined by the Gouwe, 11 m. n.e. of Rotterdam. It has a large market-place, consisting of a

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spacious square, which contains the town-house and the church of St. John. The latter building has 31 magnificent stained glass windows, given by Philip II. of Spain, Margaret of Austria, William I. Prince of Orange, and other high persons. They were executed 1555-1603 by the brothers Crabeth and others, and are among the finest in Europe. G. is famed for its tobacco-pipes: the clay used is brought from Coblenz and Namür. It has also numerous potteries, extensive brick and tile works. The bricks are called clinkers, and are much used in building and in paving. G. also manufactures cotton, woolen, and sail-cloths, has rope-walks, gin-distilleries, breweries, and a famous cheese-market. There is a stearine-candle factory which employs several hundred men and women. Book-printing, making leather, and soap-boiling also are industries. Pop. (1880) 18,120; (1901) 22,651.

GOUDIMEL, *gō-de-mě'l'*, CLAUDE: 1510-72; b. Besançon, France: musical composer. There is evidence that beside a thorough musical education he received a good classical training. In 1540 he was at the head of a school of music in Rome where Palestrina and other famous musicians were pupils. From Rome he went to Paris, and there published a setting of Horace's *Odes* in conjunction with Jean Duchemin 1555, and a setting of the French version of the *Psalms* by Marot and Beza, written in 4 parts, with the melody assigned to the tenor, 1565. Some of the tunes were adopted by the German Lutherans, and many others are still used in French Protestant churches, and a few in the United States. He composed also a number of masses and motets. G. fell a victim to the St. Bartholomew massacre at Lyons.

GOUGE, n. *gowj* [F. *gouge*—from mid. L. *gūrviā*, a chisel: Sp. *gubia*, a hollow chisel]: a rounded hollow chisel for cutting channels or grooves in wood or stone: V. to scoop out as with a gouge; to force out, as the eye, with the thumb or finger. GOUG'ING, imp.: N. the act of scooping out, as with a gouge. GOUGED, pp. *gowjd*.

GOUGH, *gōf*, JOHN B.: American temperance lecturer: 1817, Aug. 22—1886, Feb. 17; b. Sandgate, Kent, England. His father was a pensioner of the Peninsular war; his mother, a village schoolmistress. At the age of 12, he went to America as an apprentice, and worked on a farm in Oneida county, N. Y. In 1831, he went to New York, where he found employment in the binding department of the Meth. book establishment; but habits of dissipation lost him this employment, and reduced him to that of giving recitations and singing comic songs at low grog-shops. He was married 1839; but his drunken habits reduced him to poverty and delirium tremens, and probably caused the death of his wife and child. A benevolent Quaker induced him to take the pledge; and he attended temperance meetings and related his experience with such effect as to influence many others. In 1842, he fell into a snare laid for him and had a single relapse into drunkenness; but an eloquent and evidently most sincere confession restored him to favor.

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and he lectured in various parts of America with immense success. In 1853, he was engaged by the London Temperance League to lecture two years in the United Kingdom, where he drew vast crowds by his earnest, and by turns amusing and pathetic orations. An autobiography and a vol. of his addresses had a wide circulation. He was a devout Christian, of sincere purpose and unflagging zeal, giving his help freely to all efforts for public good. His residence was for many years near Worcester, Mass., where he was held in high regard by the whole community. He died at Philadelphia.

GOUJEEER, n. *gôjêr* [OF. *gouge*, a servant, a prostitute; F. *goujat*, a blackguard]; in *OE.*, the venereal disease.

GOUJON, *gó zhōng'*, JEAN: about 1515-72; b. Paris: sculptor and architect. He was employed on the church of St. Maclou at Rouen 1540, and on the cathedral there 1541; worked with Pierre Lescot, architect of the Louvre, on the restorations of St. Germain l'Auxerrois 1542-44; was employed with Bullant on the Chateau d'Ecouen; and on the accession of Henry II. entered the royal service. In the Louvre he executed the reliefs of the Escalier Henri II., the carvings at the s.w. angle of the court, and the Tribune des Cariatides, and he was the author of what is considered the masterpiece of French sculpture, the *Diane Chasseresse* now in the Louvre collection. In 1561 he was suspected of Huguenot tendencies, and as from that year his name does not appear in the Louvre accounts, it is believed that he was among those in the royal employment whom the Rom. Catholics that year attempted to have dismissed. There is no direct evidence of his death, but it is believed to have occurred in the St. Bartholomew massacre.

GOU'KEKA (or GOTCHA, or SEVANG), LAKE OF: deep inland lake of Russian Armenia, lat. 40° 8'—40° 35' n., and long. 44° 45'—45° 35' e.; 30 m. n.e. of Eriwan. It is 47 m. in length from n.w. to s.e., 15 m. in average breadth, and is in a mountainous district 5,300 ft. above sea-level. It is very deep, and yields good fish; its banks abound in volcanic products; and without having any considerable outlet, it receives the waters of several streams.

GOULARD'S EXTRACT, n. *gô-lârdz'* [named after Thos. Goulard, a surgeon who discovered it]: in *pharm.*, a saturated solution of basic lead acetate, used as a lotion in cases of inflammation.

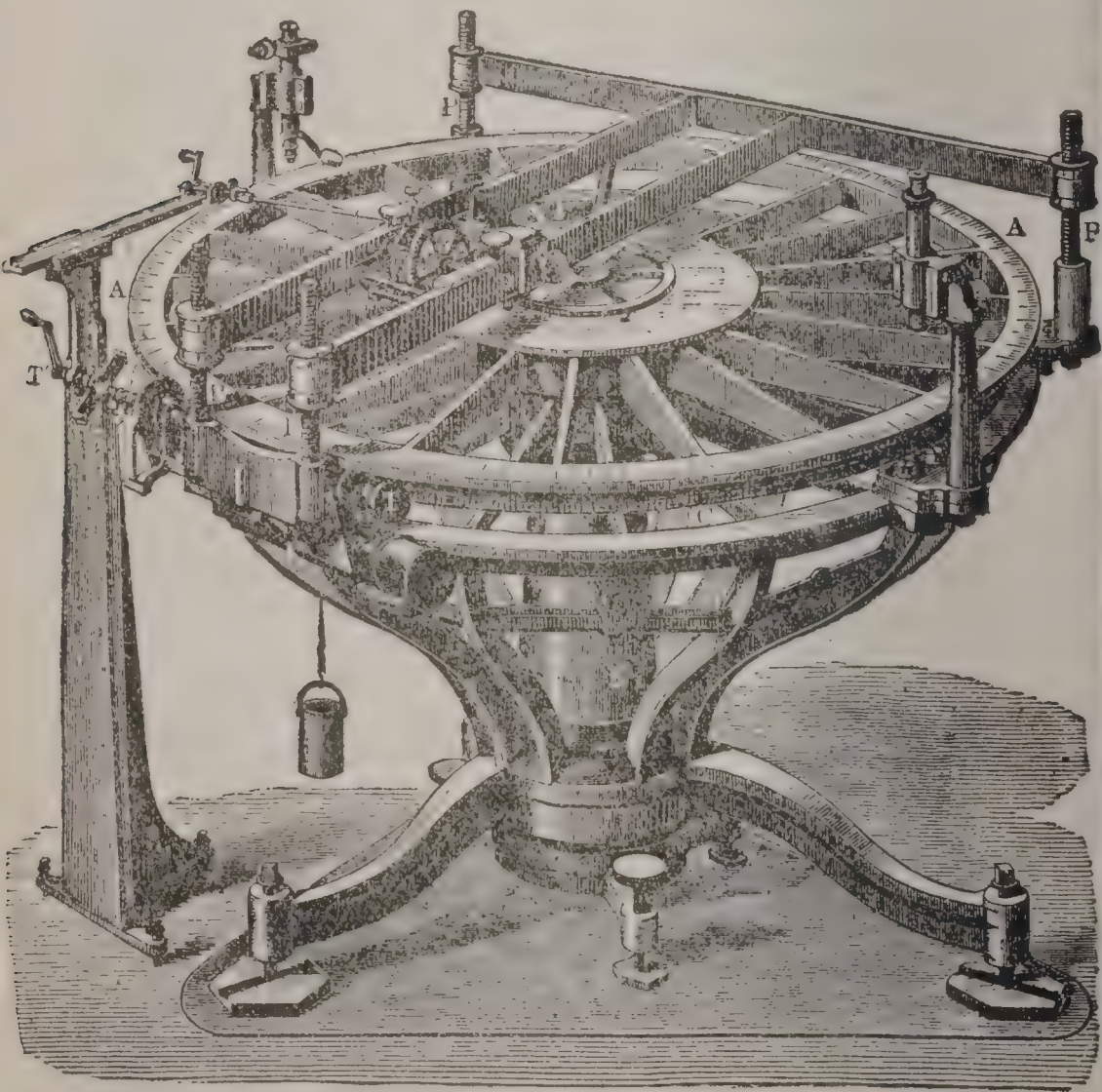
GOULD, *gôld*, AUGUSTUS ADDISON, M.D.: 1805, Apr. 23—1866, Sep. 15; b. New Ipswich, N. H.: naturalist. He graduated at Harvard College 1825, and its medical dept. 1830; spent some time as scientific instructor there; began practicing in Boston, and was appointed visiting physician to the Mass. Gen. Hospital 1856. His scientific studies led him to the special fields of botany, zoology, and conchology; and in the latter he became one of the most eminent authorities in the world. He aided Sir Charles Lyell in his geological investigations in the United States; examined, classified, and reported on the shells collected by the Wilkes (1846) and the Ringgold and Rogers (1860) expeditions; was



The Squash Gourd (*Cucurbita melopepo*): Flower and Fruit.



Grallæ.—Heron.



Graduation.—Dividing-engine: A, A, Circle, ratched into teeth at lower edge, C; E, axis of circle; TT', Tangent-screw; T', A handle for turning it; T. A disk shaped head; D, Carriage; P, P, P, P, Pillars; K, A handle.

GOULD.

a founder of the Boston Soc. of Nat. Hist., pres. of the Mass. Med. Soc. 1864-6, fellow of the American Acad. of Arts and Sciences and of the American Philosophical Soc., and a founder of the National Acad. of Sciences. Besides a great number of reports, he published *A System of Natural History* (1833); *Mollusca and Shells* (1846); *The Mollusca of the North Pacific Expedition* (1860); and *Otia Conchologia* (1862).

GOULD, BENJAMIN APTHORP, PH.D., LL.D.: astronomer: b. Boston, 1824, Sep. 27; son of BENJAMIN APTHORP G. (1787-1859), who was principal of the Boston Public Latin School. G. received the Franklin gold medal at the Latin School, graduated at Harvard College 1844, was master of the Roxbury Latin School one year, and spent 3 years studying astronomy in the Greenwich, Paris, Berlin, Göttingen and Altona observatories. On his return to the United States he established at Cambridge *The Astronomical Journal*, and conducted it chiefly at his own expense 1848-61. He was in charge of the longitudinal operations of the U. S. Coast Survey 1851-67; made the first determination of transatlantic longitude by telegraph cable at Valentia, Ireland, 1866; was director of the Dudley Observatory at Albany, superintended its construction, planned its principal instruments, and set up the first clock that gave the time telegraphically to distant dials 1856-59, and was given charge of the statistics of the U. S. Sanitary Commission, with which he organized a system of valuable anthropological measurements 1863. In 1868 he was appointed by the govt. of the Argentine Republic, S. A., to organize and direct a national observatory at Cordova, where he remained till 1885. During this period he completed a set of maps of the stars visible to the naked eye from the observatory, took observations on more than 83,000 of them, made various telegraphic determinations of longitude, and established a national meteorological bureau. He returned to Cambridge 1885, and re-established *The Astronomical Journal*. D. 1893, Nov. 26.

GOULD, HELEN MILLER: an American philanthropist: b. 1868, June 20; daughter of the late Jay Gould. Her name became widely known through her numerous gifts to educational and charitable enterprises. At the beginning of the American-Spanish war she gave \$100,000 to the government, and became actively engaged in the Woman's National War Relief Association, toward the work of which she gave freely. When the sick soldiers were taken to Camp Wikoff, L. I., she gave \$25,000 for needed supplies. Among her many others gifts were \$380,000 to the University of New York, 1898; \$50,000 to the Young Men's Christian Association of Brooklyn for a naval branch; and \$100,000 to the University of N. Y., 1900, for a Hall of Fame for Great Americans.

GOULD, JAMES, LL.D.: 1770, Dec. 5-1838, May 11; b. Branford, Conn.: lawyer. He graduated at Yale College 1791, was tutor there 1793-95, studied law in the Litchfield (Conn.) Law School (see LITCHFIELD); was admitted to the bar, was prof. and supt. of the Litchfield Law School

GOULD—GOUNOD.

1798-1833, and judge of the Conn. supreme court 1816-19. He published *Principles of Pleading in Civil Actions* (New York 1832).

GOULD, JAY: financier: b. Roxbury, Delaware co., N. Y., 1836, May 27. He was brought up on his father's farm, attended Hobart College a short time, acquired a taste for mathematics and surveying; made surveys of Ulster, Albany, and Delaware counties, and began his railroad career directly after the panic of 1857. He invested all his money in bonds of the Rutland and Washington railroad, and became pres., treas., and supt. of the road. Soon afterward he effected a consolidation of his road with the Rensselaer and Saratoga road, withdrew his capital, removed to New York, opened a broker's office, and began dealing in Erie railroad stocks and bonds. In association with James Fisk, Jr. (q.v.), he entered the directory of the company, and was selected pres. with Fisk as vice-pres. and treas. On the reorganization of the company 1872 he lost official connection with it. A long litigation ensued between the English bondholders and the company, which resulted in his being compelled to relinquish several millions in stocks and bonds. He then invested heavily in the various Pacific railroads, secured control of a number of important lines, built branches, and effected combinations which resulted in the establishment of what is known as the 'Gould System.' For many years he remained the largest holder of Western Union Telegraph and New York Elevated Railroad stocks, and was (1889) pres. of the Manhattan Elevated Railroad Company, which virtually owns all the other elevated roads. He was a man of great activity and shrewdness, and evoked criticism for some of his financial transactions. He d. 1892, Dec. 2.

GOULD, THOMAS R.: 1818-1881, Nov. 26; b. Boston: sculptor. He was engaged in the dry-goods business till 1850, then studied modelling with Seth Cheney in Boston, had a studio there till 1868, when he removed to Florence, Italy. He made a brief visit to Boston 1878, and died in Florence. He made busts of Emerson, Gov. Andrew, Seth Cheney, William Monroe, and the elder Booth, portrait statues of John Hancock and Gov. Andrew, medallions of *Christ* and *Satan*, and statues of *The West Wind*, *Cleopatra*, *Timon of Athens*, and *Ariel*.

GOULE, n. *gól*: the same as GHOUŁ.

GOULE, n. *gól* [OF. *goule*; F. *gueule*; L. *gula*]: the throat.

GOUNOD, *gô-nô'*, FÉLIX CHARLES: French operatic composer: b. 1818, Paris. He studied at the Conservatoire there under Halévy, also under Lesueur and Pauer. Obtaining the first prize of the institute 1839, he was sent to Rome to complete his musical education, studying chiefly religious music. After his return to Paris he was attached to the church of the Missions Etrangères, where his earliest compositions were performed: one, a *Messe Solennelle*, was the work which first brought him into general notice. For a time, he contemplated taking holy orders, and went

GOUR—GOURD.

through part of the preliminary novitiate. His first opera, *Sapho*, was produced 1851; in 1852, he wrote choruses for Ponsard's drama of *Ulysse*; and 1854 appeared his opera *La Nonne Sanglante*. His comic opera, *Le Médecin malgré lui*, 1858, was a great success; and *Faust*, 1859, at once attained European popularity, and raised its composer to the foremost rank of contemporary musicians. *Philemon et Baucis* followed 1860; in 1862, *La Reine de Saba* (brought out afterward in England as *Irene*), and *La Colombe*; 1861, *Mireille*; 1864, the oratorio *Tobias*; 1867, *Romeo and Juliet*; 1878, *Polyeucte*; 1881, *Le Tribut de Zamora*. In G.'s compositions are deep musical science, a profusion of new and original combinations, and an almost unequalled command of the resources of the orchestra. There is great dramatic power in his operas, and one of their marked features is the prominence given to declamation over melody. The oratorio of *The Redemption*, highly successful at the Birmingham Festival (England) 1882, is regarded by G. as his masterpiece ('opus meæ vitæ'). He d. 1896, Oct. 18.

GOUR: see GAUR.

GOURA, *gô'ra* (*Lophyrus coronatus* or *Columba coronata*): by far the largest of the pigeon family (*Columbidae*); native of Java, New Guinea, and other islands of the Indian archipelago. It is two ft. four inches in length from the tip of the bill to the extremity of the tail. It is a very beautiful bird, of a grayish-blue color, parts of the back and wings black and purplish-brown, a broad white bar across the wings. The head is adorned with a large semi-circular crest of narrow straight silky feathers, always carried erect. The G. is in the highest esteem for the table, and might probably be domesticated with great advantage in tropical countries; but attempts to introduce it into the poultry yards of Holland have completely failed, owing to the climate.

GOURD, n. *gôrd* or *gôrd* [F. *gourde*—from OF. *gou-hourde*—from L. *cūcur'bita*]: plant which produces a large fruit somewhat of a bottle shape, native of warm climates; also its fruit; a vessel for liquids, made from the hard outer shell of the *Lagenāriā vulgārīs*. GOURDY, a. *gôr'dī*, swelled in the legs. GOUR'DINESS, n. swelling on a horse's leg.

GOURD, *gôrd* (*Cucurbita*): genus of plants of nat. ord, *Cucurbitaceæ*, nearly allied to the cucumber; having male and female flowers on the same plant, the flowers large and yellow. The species are annual plants of very rapid growth; their leaves and stems rough; their leaves broad and lobed; their stems often very long and trailing; native of warm climates, though the native region of the kinds chiefly cultivated is very uncertain, and they have probably been greatly modified by long cultivation, so that perhaps all of them may be forms of one original species, native of some warmer parts of Asia. The COMMON G. or PUMPKIN (*C. pepo*), with smooth globose or pear-shaped fruit, varying from the size of a large apple to 50 or 70 lbs. in weight, is much cultivated in gardens and fields in

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almost all parts of the world where the climate is warm enough for it; and the fruit is not only a very important article of human food, but is used also with the superabundant shoots for feeding cattle. In many countries pumpkins are a principal part of the ordinary food of the poorer classes, and are much used even by the wealthy; they are eaten not raw, but dressed in a great variety of ways—as in pies, with apples, sugar, spice, etc., or sliced and fried with oil or butter, or made into soups, etc. Pumpkins are much cultivated in N. America. In England, they are not largely used, and never as food for cattle.—The VEGETABLE MARROW (*C. ovifera* or *C. succada*) appears to be a mere variety of the pumpkin. It was introduced into Europe from Persia since the beginning of the 19th c., but is now more generally cultivated in Britain than any other kind of G., being one of the most hardy, and its fruit of excellent quality and useful for culinary purposes at almost every stage of its growth. When full grown the fruit is elliptic, very smooth, generally about nine inches long, and four inches in diameter; but these dimensions are occasionally much exceeded.—One of the most valuable gourds for culinary purposes is the GREAT G. (*C. maxima*); of which the Spanish G. is a green-fruited variety; and the Great Yellow G., the largest of all, has yellow fruit, with firm flesh of a deep yellow color. It is sometimes fully 200 lbs. in weight, and eight ft. in circumference. The form of the fruit is a somewhat flattened globe; when boiled, it is pleasant and wholesome food. It is much cultivated in s. Europe.—The SQUASH (*C. melopepo*) differs from all these in generally forming a bush, instead of sending out long trailing shoots; also in the extremely flattened fruit, the outline of which is generally irregular, and its whole form often so like some kinds of cap, that in Germany one variety is commonly known as the *Elector's Hat*, and the name *Turk's Cap* is bestowed on another. The Squash is regarded as one of the best gourds, and is much cultivated in some parts of Europe and in N. America.—The WARTED G. (*C. verrucosa*), which has a very hard-skinned fruit covered with large warts, and the MUSK G. (*C. moschata*), distinguished by its musky smell, are less hardy than the kinds above named; as is also the ORANGE G. (*C. aurantia*), sometimes cultivated for its beautiful orange-like fruit, which, however, though sometimes edible and wholesome, is frequently very unfit for use, on account of colocynth developed in it. This is apt to be the case in some degree with other gourds also, but the bitter taste at once reveals the danger. The same remark is applicable to the young shoots and leaves, which, when perfectly free from bitterness, are an excellent substitute for spinach. It has been suggested that railway-banks might be made productive of a great quantity of human food by planting them with gourds. Ripe G. may be kept for a long time in a cool, well-ventilated place, and they are not injured by cutting off portions for use as required. The name G. is often extended to many other *Cucurbitaceæ*. See SQUASH.

GOURDS—GOURMAND.

GOURDS, or **GORDS**, n. *gōrds* [probably connected with preceding]: in *OE.*, false dice, so made by one or more small cavities, as distinguished from *jullams*, which are loaded dice.

GOURKO, *gór'ko*, Count **JOSEPH VASSILYÉVICH**: Russian soldier: b. Poland, 1823. He was educated in the imperial corps de pages, appointed ensign of the hussar regt. in the imperial body-guard 1846, promoted capt. 1857, made adjt. to the emperor 1860, promoted colonel 1861, commander of the 4th hussar regt. of Marinpol 1866, appointed maj.gen., and attached to the imperial suite 1867, commander of the grenadier regt. of the imperial guards, and of the 1st brigade, 2d. div. of the cavalerie de la garde 1873. He served through the Crimean war, but won his chief distinction as commander of the vanguard of the imperial army in the Russo-Turkish war. He assaulted and took the strongly fortified town of Tirnova 1877, June 25, occupied and defended the Shipka, Hanko, and other passes of the Balkan Mountains, and in midwinter led the Russian armies across the mountains to the fertile valleys beyond, and then occupied Sofia, Philippopolis, and Adrianople. For his great services he was promoted lieut.gen, and adj.-gen., created count 1878., Apr., and appointed an officer of nearly all Russian orders. He subsequently was appointed gov. of Warsaw, and 1882, Jan., gov.gen. of Odessa.

GOURMAND, n. *gór'mánd*: see **GORMAND**.

GOUT.

GOUT, n. *gout* [L. *gutta*, a drop]: in *OE.*, a drop; a clot.

GOÛT, n. *gô* [F. *goût*—from OF. *goust*; It. *gusto*—from L. *gustus*, taste]: taste; relish.

GOUT, n. *gout* [F. *goutte*, a drop, the gout—from L. *gutta*, a drop, so called from the old medical theory which attributed all disorders to the settling of a drop of morbid humor upon the part affected: Dut. *goete*, the palsy]: painful disease of the joints or extremities, to which high livers are most liable; it is often hereditary. **GOUT'Y**, a. -*y*, subject to the gout or affected with it. **GOUT'ILY**, ad. -*ly*. **GOUT'INESS**, n. -*ness*, state of being affected with the gout. —*Gout* is a mediæval term of uncertain date, derived from the humoral pathology (see **RHEUMATISM**), denoting a specific constitutional disorder, which occurs most frequently in persons habituated to luxury and past middle life. The acute attack begins usually by a painful swelling of the ball of the great toe or of the instep, sometimes of the ankle or knee; rarely, it attacks both lower limbs at once; more rarely, it seizes first on some other part of the body, the foot being either not attacked at all, or becoming involved at a later period. In the great majority of cases, the foot is not only the first part attacked, but the principal seat of the disease throughout; according to Scudamore, indeed, this is the order of events in not much less than four-fifths of the cases. In exceptional instances, the ankle, knee, hand, elbow, etc., are attacked at first; now and then, the disease smolders in the system in the form of disorders of the digestive or nervous functions, or oppression of the circulation for considerable time before it takes the form of 'regular' gout—that is of an acute attack, or fit, of gout in the foot. The name *podagra* [Gr. *pod*, foot, and *agra*, seizure] indicates the leading character of the disease as apprehended by all antiquity; and the very numerous references to the disorder so called, not only in the medical writings of Hippocrates, Galen, Aretæus, Cælius Aurelianus, and the later Greek physicians, but in such purely literary works as those of Lucian, Seneca, Ovid, and Pliny, show the frequency and notoriety of the disease. The allusions show that the essential characters of gout have not been changed by the lapse of centuries; it is caricatured by Lucian in his burlesque of *Tragopodagra* in language quite applicable to the disease as now observed; while the connection of it with the advance of luxury in Rome is recognized by Seneca (*Epist.* 95) in the remark that in his day even the women had become gouty, thus setting at naught the authority of physicians, who had asserted the little liability of women to gout. Pliny likewise (book 26, chap. 10) remarks on the increase of gout in his own time; he is of opinion, further, that the disease must have been imported; for if it had been native in Italy, it surely would have had a Latin name. Ovid and Lucian represent gout as mostly incurable by medicine; from this view Pliny dissents. The list of quack remedies given by Lucian is one of the most curious relics of antiquity.

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In the present day, gout is observed to prevail wherever there is an upper class having abundant means of self-indulgence, and living without regard to the primeval law of humanity 'in the sweat of thy face shalt thou eat bread.' The directness, however, with which gout can be traced, in particular cases, to its predisposing causes is very various; and in many instances, a well-marked hereditary tendency to the disease may be observed, which even a very active and temperate life can scarcely overcome; while, on the other hand, the most gross forms of excess may be practiced for a whole lifetime without incurring the gouty penalty. It is difficult to explain these variations; but they leave unaffected the general principle, that gout is a disease especially of those who have little physical exertion, and give great scope to the bodily appetites. The prevention and cure, accordingly, have been at all times recognized as founded mainly on temperance, with active and regular exercise. Opportune calamities creating the necessity for labor, and removing the means of self-indulgence, are said to have brought cure. With a few special exceptions, those that labor in the open air, are seldom attacked by this disease. Those that labor much with the mind, not being subject to great privations, or restrained by abstemiousness, are remarkably subject to gout; the more so if their bodily and mental constitution, originally robust, has fitted them for activity. Gout is thus the counterpoise in the scales of fortune to many worldly advantages.

Sydenham, in his treatise on gout nearly 200 years ago, truthfully described the paroxysm of regular gout: the following is an abbreviation. After some weeks of indigestion, with flatulent swelling and a feeling of weight, rising to a climax in spasms of the thighs, the patient goes to bed free from pain, and having had more than the natural appetite. In the night, he is awakened by a pain in the great toe, or sometimes in the heel, the ankle, or the calf of the leg. The pain resembles that of a dislocated bone, and is accompanied by a sense as if water not perfectly cold were poured over the affected limb; to this succeeds chilliness, with shivering, and a trace of feverishness, which diminish as the pain increases. From hour to hour, until the next evening, the patient suffers a variety of torture in every separate joint of the affected limb; the pain being tearing, or crushing, or gnawing; the tenderness such that the weight of the bed-clothes, or the shaking of the room from a person's walking, seems unbearable. The next night is one of tossing and turning, the uneasy limb being constantly moved to find a better position; till toward morning the victim feels sudden relief, and falls into a sleep, from which he wakes refreshed, to find the limb swollen; the venous distention usually present in the early stage having been succeeded by a more general form of swelling, often with itching between the toes, and a peeling off of the cuticle. This individual attack may be repeated many times, in the course of what is termed 'a fit of the gout,' which commonly extends over a period of

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weeks, or even months, before the patient is completely relieved; or the attacks may occur in both limbs, or in several other parts of the body in succession, the real termination of the 'fit' being at last indicated by an apparent restoration of health, and even, in some cases, by a period of improved condition and capacity for exertion, as compared with the state of the patient before the attack.

The 'regular gout' in this form might almost be called a local disease; though the connection of the attacks with deranged digestion, or with a variety of minor ailments and the obvious relief obtained through the 'fit' from the symptoms of constitutional suffering, point to a cause of the disease operating over a larger range of functions. Regular gout, accordingly, forms only part of a nosological picture, in which the so-called irregular, atonic, metastatic, or retrocedent forms have to be included before it can be said to be complete. These, indeed, are the darker shadows of the picture; for regular gout, though a very painful disorder, is scarcely dangerous. The danger lies in the tendency of gout, when recurring often, to pass into irregular forms. One source of local aggravation, soon apparent, leads rapidly to other evils. The joints, repeatedly the seat of the regular paroxysm, become, more or less permanently, crippled and distorted. A white, friable, chalk-like material is gradually deposited around the cartilages and ligaments, and sometimes in the cellular tissues and under the skin. Sometimes this material is discharged externally by ulceration, and then usually with relief. At other times, it accumulates into irregular masses, or 'nodosities,' which entirely destroy, or at least greatly impair, the movement of the limb. The patient is laid up in his arm-chair; and exercise, the great natural remedy of the gouty, is denied by the conditions of his disease.

Then follow aggravations of all the constitutional sufferings; more marked, perhaps, in proportion as the local attacks in the foot become less so. Indigestion continues, or becomes constant, assuming the form chiefly of acidity after meals; the liver becomes tumid, the abdomen corpulent, the bowels disposed to costiveness: the kidney discharges a vitiated secretion, and frequently there is tendency to gravel and calculus (q.v.); the heart is affected with palpitations, or fainting-fits occur, sometimes with spasmodic attacks of pain; the arteries become the seat of calcareous deposits, and the veins are varicose in the limbs and in the neighborhood of the lower bowel (see PILES); the temper is singularly irritable, and often morose; then, sooner or later, the appetite fails, or is kept up only by very stimulating and unwholesome diet, with an excess of wine or of alcoholic liquors; in the end, the body emaciates, the energy of all the functions becomes enfeebled, and the patient falls a prey to diarrhea, or to some slight attack of incidental disease. Sometimes the end is sudden, as by apoplexy or structural disease of the heart; sometimes, on the other hand, it occurs in one of those violent spasms which have popularly acquired the name of 'gout in the stomach,' the true character of which is not understood.

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Evidently this disease is one that lurks in the constitution, at times, under the disguise sometimes of robust health. It has been an object, accordingly, with physicians to trace out the gouty predisposition under the name of a habit of body, or *diathesis*, cognizable previously to any of the local manifestations. At this point the theories and descriptions of authorities usually become hazy and contradictory. The anomalous forms of the disease also are exceedingly difficult to describe: they are omitted in this summary.

One fact in regard to gout has relation to its intimate chemical and structural pathology, not less than to its outward characters; and forms, in fact, the pathological connection of a great number of its phenomena. The concretions found in the joints in all cases of well-marked and highly-developed gout have a nearly uniform composition, into which the urate of soda (see URIC ACID) enters as a considerable proportion. Uric acid has long been known as one of the constant organic elements of the urine, through which it seems to be habitually expelled from the system. In certain circumstances, uric acid is deposited also in the form of urinary gravel or calculus (q.v.); and it is this particular kind of gravel to which the gouty are especially subject, as we have indicated above. A conjunction of facts so striking as these could not but arrest the attention of pathologists; and it is long since Sir Henry Holland and others threw out the hypothesis, that uric acid was to be regarded as the very *materies morbi* of gout, of which ancients and moderns had been so long in search. It would be out of place to enter on the discussion of this subject here; but it must be indicated as a fact of recent discovery, that uric acid in a certain excess has been shown by Dr. Garrod to be characteristic of the blood of the gouty, although a minute amount of this substance is probably present even in perfect health. The most recent speculations, accordingly, tend to connect the gouty predisposition either with an excessive formation, or a checked excretion, of this important nitrogenous organic acid, the product, as physiology teaches, of the vital disintegration of the flesh and of the food, after these have subserved the daily wants of the system. At this point, the inquiry rests for the present.

The *cure* of gout, in the highest sense of the word, demands the careful consideration of all its predisposing causes in the individual, and the strict regulation of the whole life and habits accordingly, from the earliest possible period. It is the difficulty of this which makes gout proverbially intractable; for the regular attacks of the disease seldom occur till late in life, long after the habits have been fully formed which are most adverse to the cure. Rigid temperance in eating and drinking, with daily exercise proportionate to the strength and condition of the individual in reality constitute the only radical cure. But the lesson is not learned, or learned too late. It should never be forgotten that a man of gouty family, or individually much exposed to the causes of the disease, can only hope

GOUT-WEED—GOVAN.

to escape it in his old age by habits of life formed at an early period, and there is ample evidence that the disease may be warded off by careful avoidance of most of the common dissipations of youth, and it is not less certain that there is no other way of immunity. The well known virtues of colchicum (q.v.) in treatment during the gouty fit are perhaps somewhat overrated by the public; and its dangers are not less striking than its virtues. It is certain, however, that in cautious medical hands colchicum is a remedy of great value in the gouty paroxysm; and of equal value perhaps are certain natural mineral waters, e.g. Vichy and Carlsbad. Alkalies and their salts, especially potash and lithia waters, as prepared artificially, with minute doses of iodine and bromine, have been much recommended for cure of gouty deposits. For the distinctions of gout and rheumatism, and the presumed relation between them in some cases, see RHEUMATISM.

GOUT'-WEED, or BISH'OP-WEED (*Ægopodium podagraria*): perennial umbelliferous plant, with coarse twice ternate leaves, ovate unequally serrate leaflets, stems from one to three ft. high, and compound umbels; common weed in Europe. It is a troublesome weed, very difficult of eradication. Its medicinal virtue in gout and piles is now discredited. Its smell is not agreeable, but its young leaves are used in Sweden in early spring as a pot-herb. Another English name is Herb Gerard.

GOVAN, *gōv'an*: burgh of Lanarkshire, Scotland, on the s. bank of the Clyde; though outside the municipal boundaries of Glasgow, and about three m. w. of its centre, it is connected with the city by continuous rows of buildings. The prosperity of G. is dependent on Glasgow, into which indeed it has become almost absorbed. It now contains several ship-building yards of Glasgow firms. There are at G. numerous public works, including two silk-mills. In the 16th c., this ancient village was considered one of the largest in Scotland, and even till the middle of the 17th c. it received the name of "Meikle Govane."—Pop. (1901) 76,351.

GOVERN—GOVERNMENT.

GOVERN, v. *gǔv'èrn* [F. *gouverner*; OF. *governer*; It. *governare*—from L. *gubernāre*, to direct, to govern: Gr. *kubernān*, to handle the rudder, to steer]: to direct and control; to regulate by authority; to command; to have influence or force, as a verb in grammar; to exercise authority; to restrain. **GOVERNING**, imp.: **ADJ.** holding the superiority; controlling; directing. **GOVERNED**, pp. *-èrnd*. **GOVERNOR**, n. *-èr-nér*, one who rules or directs; one who is invested with supreme authority; a ruler; a tutor: in a *machine*, a contrivance to control the speed, usually by an application of centrifugal force with automatic action, maintaining a uniform velocity with varying resistance; a regulator (see **STEAM ENGINE**). **GOVERNORSHIP**, n. the office of a governor. **GOVERNESS**, n. *-nès*, a lady intrusted with the care and instruction of children or young ladies. **GOVERNABLE**, a. *-nā-bl*, manageable; obedient. **GOVERNANCE**, n. *-nāns*, rule; management; control. **GOVERNMENT**, n. *gǔv'èrn-měnt*, control; restraint; the exercise of authority; the ruling power in a state; the principle or system under which a state is ruled (see below): **ADJ.** connected with or pursued by government. **GOVERNMENTAL**, a. *-èrn-měnt'āl*, of or relating to government. **GOVERNANTE**, n. *-èr-nānt* [F.]: a lady who has the care of young girls of quality; a lady-tutor or governess.—**SYN.** of 'govern': to rule; regulate; direct; control; influence; manage; administer.

GOVERNMENT, in Political Signification: the power by which communities are ruled, and the means by which, and the form and manner in which, this power is exercised. In treating of the subject, we shall indicate first those characteristics that seem essential to the existence of G.; secondly, the various forms which its machinery has assumed, or is capable of assuming.

1. It is of the essence of every G. that it shall represent the supreme power or sovereignty of the state, and that it shall thus be capable of subjecting to its will every other will in the community, whether of an individual, or of a body of individuals. There is and can be no constitutional or fundamental law, not self-imposed, which is binding on a G. in this, its highest sense. Whatever be the restraints which humanity, Christianity, or prudence may impose on governments as on individuals, it is implied in the idea of a G. that it should be politically responsible to no human power, at least for its internal arrangements, or in the language of politics, that it should be autonomous. The governments of states which are members of a confederation—as, for example, the states of the American republic, or the Swiss cantons—do not, it is true, possess in all departments this independent character. But in the selected particulars in which they fall short of it, they evidently are not intended to be governments in the absolute sense; the states are states, not in the highest, but only in a subsidiary sense, or at least not in every department of G. but only in the departments assigned. The sovereign power with which G. is thus armed may be an expression either of the general will of the community itself, as in free

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states, or of the will of a conqueror, and of the army which supports him, as in subject states. In the former case, the power of G. over the individual citizen is as absolute as in the latter; but there is this very important difference between them, that in the former case he himself voluntarily contributes a portion of the absolute power to which he submits, whereas in the latter that power is entirely independent of his volition. In the power which G. possesses of controlling every other will, is implied the power and duty of protecting every separate will from being needlessly or wrongfully controlled by any other will, or number of wills, the will of the G. always excepted. With a view to the exercise of this latter power, G. possesses a right, politically unlimited, of inquiry into the relations between citizen and citizen. It is of its essence that its scrutiny should be as irresistible as the execution of its decrees. 2. Every G., whatever its form, seeks the realization of what we have described as its necessary character, by the exercise of three distinct functions, known as legislative, judicial, and executive. The first, or legislative, function of G., consists in expressing its sovereign will with reference to a particular matter, irrespective altogether of the effect which it may have on the interests of individuals; the second or judicial function, consists in applying the general rule, thus enunciated, to individual cases in which disputes as to its application have arisen; while the third, or executive function, consists in carrying into effect the determinations of the sovereign will, whether these determinations be expressed in the exercise of its legislative or its judicial functions.

In large communities, which are at the same time free—i.e., in which the general will of the people is sovereign—the performance of the legislative functions of G. almost necessarily implies the existence of a general council, parliament, or as it is often called, a legislature; while the performance of its judicial functions implies the existence of judges and courts of justice; and of its executive functions, that of a police and an army. But all of these, like the existence of councils of ministers, or servants of the sovereign will—governments in the narrower sense—and the rules by which their appointment, resignation, etc., are regulated, are practical necessities of G. in certain circumstances, not theoretical necessities of G. in the abstract.

The forms in which communities have sought to realize the idea of G., as thus explained, have been divided, from very early times, into three classes: 1st, monarchy, that form in which the sovereignty of the state is placed in the hands of a single individual; 2d, aristocracy, that form in which it is confided to a select class, supposed to be possessed of peculiar aptitude for its exercise; 3d, democracy, that form in which it is retained by the community itself, and exercised either directly, as in the small republics of ancient Greece, or indirectly, by means of representative institutions, as in the constitutional states of modern times. Each of these forms of political organization, if called into existence by an expression of the general will

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of the community, maintained by its consent, and employed for its benefit, is said to be a legitimate government (Aristot. *Politic.* lib. iii. c. 5)—i.e., a G. which vindicates the interests of the collective body of the people without needlessly encroaching on individual freedom of action. But each of these legitimate forms was said by the ancient publicists (Aristot. *ut sup.* and iii. 4, 7) to have a particular degenerate form to which it was prone. Monarchy tended in the direction of tyranny, or a G. for the exclusive benefit of the single ruler; aristocracy to oligarchy, or a G. for the exclusive benefit of the ruling class; and democracy to ochlocracy, or mob-government—a G. in which the majority, necessarily the least instructed and judicious portion of the community, exercised a tyranny over the refined and cultivated few. Through these various forms, in the order above enumerated, each legitimate form being followed by its corresponding degenerate or perverted form, G. was supposed to run in a perpetual cycle; the last form, ochlocracy, being followed by anarchy, or no G. at all, which formed a species of interregnum so abhorrent to the social and political instincts of mankind as to induce them speedily to revert to monarchy, at the expense of subjecting themselves to a repetition of the misfortunes which they had already experienced. As a refuge from these evils, the so-called mixed G., or G. which should combine the elements of order and permanence of two, at least, if not of all the three pure forms of G., while rejecting their tendencies to derangement and degeneracy, is supposed to have been devised. A union of aristocracy and democracy was the form in which Aristotle conceived the mixed G., and spoke of it under the title of the *politeia*. But the tripartite G. was not unknown to speculators of even an earlier date. Plato had shadowed it forth in his laws, and Aristotle himself tells us that it had been treated of by other writers (*Politic.* ii. c. 3). Who these writers were has been a subject of much speculation, but there is reason to believe that their works contained mere hints of the principle; and the first writer with whom we are acquainted to whose mind its practical importance was fully present is Polybius, who, with Cicero, by whom he was very closely followed in 'The Republic,' holds the tripartite form to have been realized in the Roman constitution. The most famous instance of the mixed G., however, has been supposed to be exhibited in that balance of powers which has been so often said to form the essence of the English constitution. But in addition to the fact that these are not separate powers, but only separate organs of the one power or sovereignty which in free states is of necessity centered in the general will (see CONSTITUTION), it is extremely doubtful whether any period could be pointed out, either in British history or in the history of any other nation, in which the sovereignty did not find expression obviously either through the one, the few, or the many; or whether such a period, if it did exist, was not a mere period of struggle and transition.

The question as to how far forms of G. are a matter of

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choice on the part of a free people, or are dictated to them by influences beyond their volition, has been discussed in a very interesting manner by John Stuart Mill in his important work on *Representative Government*. The conclusion at which he arrives concerning governmental forms is, that 'men did not wake on a summer morning and find them sprung up; neither do they resemble trees,' which, once planted, 'are aye growing' while men 'are sleeping;' but that 'in every stage of their existence they are made what they are by human voluntary agency' (p. 4). This absolute power of human choice, however, is limited by three conditions which Mill states thus: 'The people for whom the G. is intended must be willing to accept it, or at least not so unwilling as to oppose an insurmountable obstacle to its establishment; they must be willing and able to do what is necessary to keep it standing; and they must be willing and able to do what it requires of them to enable it to fulfil its purposes. . . . The failure of any of these conditions renders a form of G., whatever favorable promise it may otherwise hold out, unsuitable to the particular case' (p. 5). But there are still more important conditions, not here enumerated by Mill, but one of which at least is fully recognized in the sequel of his work, which, if not complied with, render forms of G. unsuitable not only to one case, or stage of social development, but to all cases and all stages of development. These conditions may be broadly stated as under a single category—viz., that forms of G. must conform to the constitution of human nature, and recognize those arrangements of Providence which are beyond the reach of human control. This condition seems so obvious, that one would suppose it could scarcely be overlooked in fixing on a peculiar form of G., yet there is none which has been overlooked more frequently. G. is an organization for practical ends; it cannot be authenticated by a mere aphorism, or based on a speculative theory, such as 'All men are socially equal,' or 'Only the wisest man or men can have the right to rule.' Pure monarchy, pure aristocracy, pure democracy, are theories; and an attempt at G. based on any one of these to the exclusion of the others, is based on an assumption contrary to nature, and can be made to work only by the direct results of its action being counteracted by some indirect means. The state in all such cases is governed not in accordance with, but in spite of 'the form of government.'

The famous discussion as to what is absolutely and in itself the best form of G. which has occupied so large a share of human time and ingenuity, is one which may be dismissed with the observation, that it rests on another question not less keenly and perhaps scarcely less futilely discussed. The basal question is, What is the end of G.? for it is clear that could the end-in-itself (the *telos-teleion*) be discovered, we might limit the discussion as to the best form of G. to an inquiry into the means leading most directly to the attainment of this end. Now there are, and have always been, two classes of speculators, who assign what

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appear to be different, and what by many are believed to be irreconcilable ends or objects to G. and indeed to human effort, separate as well as aggregate. By the one, the end of G. is said to be 'the greatest happiness of the greatest number,' or the greatest amount of human happiness absolutely considered; by the other class, it is said to be the realization of the idea of humanity—that is to say, of the divine and therefore primal conception of human nature, through the instrumentality of society. The manner in which the first or Utilitarian creed has recently been expounded by its most important adherents has tended to show that the two ends are in reality coincident. If happiness be so defined as to render it identical with moral, intellectual, and physical perfection, the advocate of the ideal end acknowledges that its attainment would involve, of necessity, the realization of his own aspirations. No lower or narrower definition of 'happiness as an end' can show itself as answering the demand which is sure to arise from man's nature for conformity or attempt at conformity to the highest conception of manhood. G., for practical reasons of the time present, may call a halt on the upward path while it waits for a slow public enlightenment, and may still control its subjects; but if it finally and openly discard all aim at the complete ideals, it therein signs its own abdication of sovereignty over men.

A difference of opinion as to the objects of G. scarcely more real, though attended with far more fatal consequences, than that which has divided speculative politicians, has ranged those who have dealt with G. as a practical art in two opposite schools. By one school, its object is said to be order; by the other, liberty; and each of these objects has been supposed to be attainable only to an extent proportioned to that to which the other was sacrificed. A truer insight into the laws of society has led a more enlightened school than either entirely to reverse this latter opinion; and—while holding the two objects referred to, to be in truth the proximate objects of all G.—to perceive that they are not only reconcilable, but that each is attainable only in and through the other, and that the perfection with which either is realized in any particular instance will be, not in inverse but in direct proportion to that to which the other is realized. Order, so far from being the opposite of liberty, is thus the principle by which the inevitable conflicting claims to liberty are reconciled. The principle really opposed to liberty is license, in virtue of which it is endeavored to carry the sphere of the liberty of one individual into that of another. To the extent to which this takes place, the liberty of both is sacrificed, for the territory in dispute is free to neither of the claimants; whereas order, by preserving the boundary between them, assigns to each the portion which is his due, and prevents the waste of liberty which is necessarily involved in the gratification of license, and the consequent existence of anarchy. For some of the reasons which have led men to believe that the union between the principles of order and liberty, which it is thus their mutual interest to effect, can, in large states, be effected by

GOVERNMENT'S ISLAND—GOWER.

means of representative institutions better than by any other political expedient yet devised: see REPRESENTATION. See also CONSTITUTION: MONARCHY: DEMOCRACY: LIBERTY, EQUALITY, FRATERNITY: LOCAL GOVERNMENT.

GOVERNMENT'S ISLAND: see ROCK ISLAND.

GOVERNOR'S ISLAND: island in the harbor of Boston, appropriated by the U. S. govt. for defensive purposes: its chief fortification is Fort Winthrop.

GOVERNOR'S ISLAND: fortified military post of the United States in the upper harbor of New York, $\frac{3}{4}$ m. s. of the Battery, 6 m. n. by e. of the Narrows, separated from Brooklyn by Buttermilk channel; it is abt. 1 m. in circumference. It contains Fort Columbus in the centre, and Castle William on the w., both built 1807-10, the barracks and headquarters of the military dept. of the Atlantic, a depot of the ordnance dept., and a rendezvous of the gen. recruiting service of the U. S. army. Castle William was the first casemated battery erected in the United States. G. I. is beautifully laid out. A movement was started 1888-9 to have it transferred to New York for a public park. The fortifications are old, and of no strength against the missiles of modern warfare, and they are so near the city as to afford scarcely any protection from a hostile fleet.

GOWAN, n. *gow'an* [Gael. *gugan*, a daisy; *guganach*, abounding in daisies, flowery]: in *Scot.*, a wild daisy. GOWANY, a. *gow'an-i*, abounding in gowans.

GOWD, n. *gowd*: in *Scot.*, gold.

GOWER, *gow'er*, or GWYR, *gwîr*: peninsula of S. Wales, forming the w. part of Glamorgan co., and extending about 15 m. into Bristol channel. Its shores are bold, rocky, and picturesque. The interior contains much beautiful scenery, an abundance of archæological treasure, and a colony of Flemings, by whom the s.w. end has been occupied since the reign of Henry I. Pop. 10,000.

GOWER, *gow'er*, JOHN: prob. abt. 1325-1408: English minor poet; recently shown to have belonged to the county of Kent. His history is enveloped in obscurity, but he seems to have been one of the most accomplished gentlemen of his time, and to have had considerable landed property. He was a personal friend of Chaucer's, who addressed him as 'O moral Gower' in dedicating to him his *Troilus and Cressida*—an epithet which has indissolubly linked itself to his name. G. did not long survive his great contemporary. He was a voluminous writer, and produced the *Speculum Meditantis* (a poetical discourse on the duties of married life), in ten books, in French verse (supposed to have perished); *Vox Clamantis* in Latin (of which there are manuscript copies in the Cottonian and Bodleian libraries); and *Confessio Amantis*, by which he is best known, in English. This latter work, at the portentous length of 30,000 verses, was printed first by Berthelet 1573. An excellent edition of the works of G. was published 1857, edited by Dr. Reinhold Pauli, with a memoir and critical dissertation.—G. is heavy and prosaic in style. His English poem is full of

GOWK—GOWRIE CONSPIRACY.

Norman-French words, and in his native tongue he never approached Chaucer's ease and mastery. Yet, his poem is interesting to the scholar and the antiquary, because therein the elements of modern English are found side by side, or scarcely fused together.

GOWK, *n.* *gowk* [prov. Eng. and Scot. *gowk*, a cuckoo; Icel. *gaurk*, a cuckoo]: one easily imposed on; a simpleton; a fool: *V.* to make a fool of any one. GOWKIT, *a.* *gowk it*, foolish; light-headed. To HUNT THE GOWK, in *Scot.*, to go on a fool's errand; to send on a fool's errand on 1st April: see GAWK.

GOWLE, *n.* *gowl* [*F. gueule*; *L. gula*, the throat]: a hollow between hills; a defile between mountains.

GOWLEE, *n.* *gow le* [*Hind. goala*; *Mahratta gawaree*]: a cowherd.

GOWN, *n.* *gown* [*OF. gone*; *It. gonna*, a gown: *W. gwn*, a gown—from *garnio*, to sew, to stitch: *Gael. gun*, a gown]: a woman's upper garment; a long, loose, light robe worn by professors, clergymen, barristers, etc. GOWNED, *pp. gownd*: *ADJ.* dressed in a gown. GOWN MAN, or GOWNSMAN, *n.* a university student. DRESSING-GOWN, a long loose robe worn by gentlemen within doors, especially in the morning before dressing.

GOWPEN, *n.* *gow pen* [*Icel. gaupn, gupn*, the hollow of the hand; *Sw. gopn*]: the hollow of the hand, when contracted in a semicircular form to receive anything; a handful. *Gowpins*, both hands held together in the form of a round vessel.

GOWRIE, CARSE OF: see PERTSHIRE and CARSE.

GOWRIE CONSPIRACY: singular event in the history of Scotland; 1600, August. On Aug. 5, as King James VI, then residing at Falkland Palace, in Fife, was going out to hunt, Alexander Ruthven, brother of the Earl of Gowrie, whose father had been put to death for treason 1584, came to his majesty, and informed him that, on the previous evening, he had seized a person of a suspicious appearance, and evidently disguised, with a pot full of foreign gold hid under his cloak, and had confined him in his brother's house at Perth. Conceiving him to be an agent of the pope or the king of Spain, the king agreed to examine the man himself, and, without waiting to change his horse, set out for Perth, attended only by the Duke of Lennox, the Earl of Mar, and about 20 others. Soon after his arrival, while his retinue were at dinner, Ruthven conducted the king up a winding staircase and through several apartments, the doors of which he locked behind him, and brought him at last to a small study, where stood a man in armor, with a sword and dagger by his side. Snatching the dagger from the man's girdle, Ruthven held it to the king's breast, accusing him of the murder of his father, and threatening death if he uttered a cry. The king expostulated; and Ruthven went to consult his brother, leaving the king in charge of the man in armor. In the meantime, one of Gowrie's servants hastily entered

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the apartment where the king's retinue were, and announced that the king had just ridden off toward Falkland. All hurried into the street, and the Earl of Gowrie, with the utmost eagerness, called for their horses. On Ruthven's return to the king, he declared that the king must die, and proceeded to bind his hands. The king grappled with him, and a fierce struggle ensued. Dragging Ruthven toward a window looking into the street, which the man in armor had opened, the king cried aloud for help. His attendants knew his voice, and hastened to his assistance. Lennox and Mar, with the greater number of the royal train, ran up the principal staircase, but found all the doors shut. Sir John Ramsay, of the Dalhousie family, one of the royal pages, ascending by a back stair, entered the study, the door of which was open, and seizing Ruthven, stabbed him twice with his dagger, and thrust him down the stair, where he was killed by Sir Thomas Erskine and Sir Hugh Herries. On the death of his brother, Gowrie rushed into the room, with a drawn sword in each hand, followed by seven retainers well armed, and was instantly attacked. Pierced through the heart by Sir John Ramsay, he fell dead without uttering a word. The inhabitants of Perth, by whom Gowrie, who was their provost, was much beloved, hearing of his fate, ran to arms, and, surrounding the house, threatened revenge. The king addressed them from a window, and admitted the magistrates to whom he fully related all the circumstances, on which the people dispersed, and he returned to Falkland. Three of the earl's servants were put to death at Perth. The man in armor, the earl's steward, was pardoned. The ulterior purpose of the G. C. remains in part obscure; though recent discoveries indicate that the object of the conspirators was to possess themselves of the king's person, to convey him by water to Fast Castle, and either to give him up to England, or to administer the government in his name in the interest of that country and of the Presbyterian leaders in Scotland. Most of the documents relating to the plot are printed.

GOWT, *n.* [Dut. *goot*; Low Ger. *góte*]: sluice in a sea-embankment for letting out the land water when the tide is out, and preventing the ingress of the sea-water.

GOYANNA, *gō-yân'ná*: city of Brazil, province of Pernambuco, on a river of the same name, 35 m. n.w. of Olinda. It has numerous factories and an active trade. Pop. more than 10,000.

GOYA Y LUCIENTES, *gō'yá ē ló-thē-ën'tès*, FRANCISCO: 1746, Mar. 31—1838, Apr. 16; b. Fuente de Todos, Aragon: most distinguished painter of the new Spanish school. He received his first education in art in the acad. at San Luis, Saragossa. His paintings for the royal tapestry manufactory gained the approbation of the celebrated Mengs. His scenes from the common life of the Spanish people excited special admiration; but all his productions during this early period—to which belong the altar-piece and the crucifix at the entrance to the choir of the church of San Francisco al

GOYAZ—GRAAF.

Grande in Madrid—are marked by simplicity of composition, charming truthfulness, and a natural and effective chiar-oscuro. In 1780, he was elected member of the Acad. of San Fernando. From this time, the influence of Velasquez and Rembrandt is observable in his paintings. Among the most celebrated of these is his portrait of Charles IV., for which he was made court-painter. In general, his portraits were executed with great felicity and ease. In 1824, he went to Paris for his health, and died at Bordeaux. Besides his works in oil-color, G. is celebrated for his essays in fresco-painting, etching, lithography, and in almost every department of his art.

GOYAZ, *gō-yáz'*: central province of Brazil; 290,000 sq. m. The chief productions are cotton, timber, and cattle. Pop. by govt. estimate (1888) about 211,721 (besides 15,000 Indians), mostly aborigines.

GOYAZ: city of Brazil, on the river Vermelho, lat. 16° 21' s., long. 50° 35' w.; 650 m. n.w. of Rio de Janeiro; nearly in the middle of the empire, being cap. of the central province, also named G. Pop. about 8,500.

GOZO, or Gozzo, *gōt'sō* (called by the Romans *Gaulos*): island in the Mediterranean, belonging to Britain; about 10 m. long, and 5 m. broad; 36 sq. m. Its surface is agreeably diversified, and it has many fertile valleys. It appears to have been formerly connected with Malta, from which it is now separated by a channel four m. wide. G. is interesting to the naturalist, while the cyclopean walls of the 'Giant's Tower' and Roman monuments of a later period excite the attention of the antiquary. The island abounds in game, and is frequented by sportsmen. It produces much grain and cotton, and is celebrated for cattle and for a breed of large asses. From the circumstance of its having two harbors, it is important in a commercial and nautical view. The chief town is Rabato, near the centre of the island. The British gov. resides in the Castel del Gozzo. Pop. of G. 17,000.

GOZZARD, n. *gōz'êrd* [corruption of *gooseherd*]: one who tends a flock of geese or keeps them.

GOZZOLI, *gōt'so-lō*, BENOZZO: born at Florence about the beginning of the 15th c.; died 1485. He studied under Fra Angelico, whose excellence as a painter of sacred subjects he equalled, perhaps surpassed. A glow of rejoicing life seems infused into all G.'s productions. His chief works bearing traces of his master's influence are frescoes in the churches of Orvieto and Rome; his own style being visible in his paintings by command of Pietro de' Medici, in a chapel of the Medici, now Riccordi Palace, Florence. G.'s fame rests on the immense frescoes on the n. wall of the famous cemetery, or Campo Santo of Pisa. This wonderful series of paintings, aptly termed by Vasari *una terribilissima opera* ('a terrific work'), was undertaken by the artist at the age of 60, and accomplished in 16 years. The scenes, all scriptural, are 24 in number, and are still in excellent preservation.

GRAAF, *gráf*, REGNIER DE: 1641–73; b. Schoonhove:

GRAAFIAN VESICLES—GRABS.

Dutch physician. He studied at the Univ. of Leyden; and when only 23 years of age, published his *Disputatio Medica de Natura et Usu Succī Pancreatici*, which, though containing several errors, gained him great reputation. After a short residence in France, where he took his doctor's degree at Angers 1665. he returned to Holland, and settled at Delft, where his practice was large. He invented those injections of the blood-vessels which, improved by Swammerdam and Ruysch, are the basis of our knowledge of most of the tissues of the body. Some dissertations on the organs of generation in both sexes involved him in a prolonged and angry controversy with Swammerdam; and Haller reports, on authority not known, that his death, at Delft, was occasioned by jaundice, brought on by the excitement of this controversy. All his works were published in one octavo vol. *Opera Omnia*, 1677; republished 1678 and 1705.

GRAAFIAN VESICLES: see OVARY.

GRAAF-REINET, *gráf-rīnēt*: one of the most important and prosperous towns in Cape Colony, s. Africa: chief town of the division of G. R. During the ten years 1847–57, it had risen from an inland village to be a centre of commerce, having its public library, college, agricultural soc., banks, newspapers, and steam and water-mills. It owes its advancement partly to its position between Port Elizabeth and the n. boundary, but principally to its being the business centre for the midland province. It is on the Sunday river, and is the terminus of a railway from Port Elizabeth. Pop. abt. 4,500.

GRAB, v. *grāb* [Sw. *grabba*, to grasp: Dut. *grabbelen*, to seize greedily—from *greb*, a dung-fork: Icel. *greipa*, to seize: Gael. *grab*, to catch: Pol. *grabki*, a rake, a fork]: to seize; to grasp suddenly; to clutch. **GRAB'ING**, imp. **GRABBED**, pp. *grābd*. **GRABBLE**, v. *grābbl*, to grope; to feel in muddy places. **GRABBLING**, imp. *-bling*. **GRABBLED**, pp. *grāb'blđ*.

GRABOW, *grā'bōr*: town of Prussia, in Pomerania, dist. of Stettin, on the Oder river, immediately below and adjoining the suburbs of Stettin. It has important shipbuilding and mechanical industries, a school of navigation and commerce, and a large shipping trade. It was incorporated as a town 1855. Pop. (1875) 10,238; (1890) 15,703.

GRABS, *grābz*: vessel of 150 to 300 tons, employed on the Malabar coast. They are broad armed ships, with two or three masts, and unsuited for very heavy weather.

GRACCHUS.

GRACCHIUS, *grāk'ūs*: Roman family of the gens Sempronia, which contributed several famous citizens to the state.—First was **TIBERIUS SEMPRONIUS G.**, consul B.C. 238, who conducted some warlike operations in Corsica and Sardinia.—Another **TIBERIUS SEMPRONIUS G.** distinguished himself in the second Punic war, and for his success in opposing Hannibal, was honored with the consulship B.C. 215 and 213. In those days of despondency, he did much to revive the spirit of the senate and people; with the allies, and 8,000 *volones*, or volunteer slaves (who afterward gained their liberty as a reward), he withstood the Carthaginians in s. Italy, defeated Hanno, and held in check Hannibal himself; but after many victories, he lost his life, either in battle with Mago, or by treachery: Hannibal honored him with a splendid funeral.

Passing by some Gracchi of minor note, as the augur of B.C. 203, the tribune of B.C. 189, and others, we come to **TIBERIUS SEMPRONIUS G.**, b. abt. B.C. 210; father of those two reformers and friends of the people whose fame has overshadowed all the others. He was for many years foremost in the state; successively tribune, ædile, pretor, consul (twice), and censor, and distinguished in several wars. He introduced some important constitutional changes, and was often employed on foreign embassies, in which his judgment and conciliatory spirit were of great service to the state. He married Cornelia, youngest daughter of P. Scipio Africanus, by whom he had 12 children. Nine of these died in youth; a daughter, Cornelia, married Scipio Africanus the younger. For the history of his two sons see below.

GRACCHUS, **CAIUS SEMPRONIUS**: Roman popular leader: abt. B.C. 159–121; son of Tiberius Sempronius G. (b. abt. B.C. 210—see GRACCHUS, Family). He had much greater natural powers than his older brother, whose death while Caius was serving in Spain under Scipio Africanus, deterred him for some years from entering into public life. The nobles seeing his great abilities, and fearing his influence with the people, endeavored to keep him as long as possible on foreign service in Sardinia and elsewhere. At length he unexpectedly returned to Rome, being urged by his brother's shade, as was said, to enter on his great mission. Goaded by the persecution and groundless accusations of his enemies, he stood for the tribuneship, and was elected B.C. 123. After bringing forward some measures to take vengeance on his brother's murderers, he set himself to carry out the agrarian law, which, though not repealed, had by the machinations of the nobles been kept in abeyance. The two great aims of his legislation—viz., to improve the condition of the poor, and to curtail the power of the senate and nobles—were now prosecuted with the utmost vigor, and with unflinching steadiness. To develop the resources of Italy, and at the same time to employ the poor, he made new roads throughout all parts of the country, repaired old ones, and erected milestones. By his zeal, and by his unwearied industry in personally carrying out his own measures, even to superintending the ex-

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ecution of the public works, and by his affability and kindly good nature, he gained the esteem and approbation of those with whom he came in contact. With the equites and the poorer classes, he was in special favor. But he at length fell, as his brother had done, by the intrigues of the nobles. One of his colleagues, M. Livius Drusus, was bribed by the opposite faction, and soon succeeded in undermining the influence of Caius by far surpassing him in the liberality of his public measures, and by his benefits to the commons. G. having stood for the tribuneship a third time, was rejected, and having incited the populace to violence, the consul Opimius who had been armed for the purpose with absolute power, attacked the party of Caius. A fearful struggle took place in the streets of Rome, in which 3,000 men are said to have perished. Many others were imprisoned, and afterward put to death. Caius who had held aloof from the fight, fled at last, and escaped to the grove of the Furies with a single slave, whom he commanded first to slay his master, and then himself. The people saw too late, their guilty folly, and endeavored to atone for their crime by erecting statues to the brothers G., by declaring sacred the spots where their blood had been shed, and by offering sacrifices to them as to deities. The character and aims of Caius doubtless compare favorably with those of his adversaries; yet he lacked his brother's sincerity and disinterestedness.

GRACCHUS, TIBERIUS SEMPRONIUS: Roman patriot: abt. B.C. 168-133; son of Tiberius Sempronius G. (b. abt. B.C. 210—see GRACCHUS, Family). He was educated with great care by his excellent mother (his father having died while he was yet very young). He saw military service first under his brother-in-law, Scipio Africanus the younger, whom he accompanied to Africa. He was present at the capture of Carthage, and is said to have been the first of the Romans to scale the walls. B.C. 137, he acted as questor to the army of the consul Mancinus in Spain, where the remembrance of his father's good faith and clemency was so fresh after 40 years' interval, that the Numantines would treat with no other Roman but the son of their former benefactor. He was thus enabled to save from utter destruction a defeated army of 20,000 Romans who were at the mercy of the Numantines. But the peace was considered by the aristocratic party at Rome disgraceful to the national honor, and was repudiated, Mancinus being stripped naked, and sent back to the Numantines, that the treaty might thus be rendered void. Disgust and disappointment at this result are said by some, on insufficient evidence, to have determined G. to espouse the cause of the people against the nobles: a much more feasible ground for his conduct is found in the oppressed state of the commons at the time. Being elected tribune he endeavored to reimpose the Agrarian Law of Licinius Stolo, and after violent opposition on the part of the aristocratic party, who had bribed his colleague M. Octavius Cæcina, he succeeded in passing a bill to that effect. (For a detailed account of the measure, see AGRARIAN LAW.) Tiberius G., his brother

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Caius, and his father-in-law Ap. Claudius, were appointed triumvirs to enforce its provisions. Meantime, Attalus, King of Pergamus, died, and bequeathed all his wealth to the Roman people. G. proposed that this should be divided among the poor, to enable them to procure agricultural implements, and to stock their newly-acquired farms. It is said that he also intended to enlarge the franchise, and to receive Italian allies as Roman citizens. He also diminished the time which citizens were required to serve in the army. But fortune turned against the good tribune. He was accused of having violated the sacred character of the tribuneship by the deposition of Cæcina, and the always fickle people in large numbers deserted their champion and benefactor. At the next election for the tribuneship, his enemies used all efforts to oust him; and a violent struggle having arisen between the opposing factions, G. was slain, with more than 300 others. His surviving friends were imprisoned, exiled or put to death.

GRACE, *n.* *grās* [F. *grace*, favor—from L. *grātia*, favor, grace—from *gratus*, pleasing: Lith. *grazus*, fair, agreeable: Gael. *gràdh*, love, fondness]: favor; good-will; the free and unmerited favor of God; good disposition proceeding from Divine favor; a state of reconciliation to God; mercy; pardon; the Gospel; elegance; any natural or acquired excellence; behavior, considered as *good* or *bad*—as, he did it with a very *bad grace*; privilege; a short prayer before or after a meal; the title used in addressing a duke or an archbishop; act or decree of a university: *V.* to adorn; to honor. GRA'CING, *imp.* GRACED, *pp.* *grāst*: ADJ. endowed with grace; in *OE.*, virtuous; chaste. GRACE'FUL, *a.* *-fūl*, elegantly easy—used with reference to motion, looks, and speech; possessing an agreeable dignity of manner. GRACE'FULLY, *ad.* *-lī*. GRACE'FULNESS, *n.* GRACE'LESS, *a.* *-lēś*, coarse; rude; wicked; depraved. GRACE'LESSLY, *ad.* *-lī*. GRACE'LESSNESS, *n.* GRACIOUS, *a.* *grā'shūs*, favorable; kind; disposed to show kindness or favor. GRA'CIOUSLY, *ad.* *-lī*. GRA'CIOUSNESS, *n.* kind condescension; mercy. GRACE-NOTES, or GRACES, in *music*, ornamental notes added to the principal ones to increase their effect, or for mere embellishment; e.g., trills, turns, beats, etc. GOOD GRACES, *grā'sis*, favor; friendship. THE GRACES, in *anc. myth.*, three beautiful sisters who attended on Venus, and who were said to confer beauty (see below); beauties; arts of pleasing. To SAY GRACE, to give thanks to God for food, before or after a meal, or both—GRACE AT MEAT, thanks given to God before or after a meal. MEANS OF GRACE, the methods or ways appointed by God to obtain His mercy and love, as, prayer, worship, the sacraments, preaching, etc. DAYS OF GRACE: see BILL: DAY. GRACE-CUP, in *former times*, the last cup of liquor drunk before retiring to rest. AIRS AND GRACES, amusing acts of affectation.—SYN. of 'grace, *n.*': charm; comeliness; kindness; mercy; privilege; beauty;—of 'gracious': merciful; benignant; benevolent; beneficent; friendly.

GRACE: expression frequently used in Scripture and in

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theological discussion, denoted free and unmerited loving-kindness. According to Aristotle, this is the proper meaning of *charis* (Gr. grace), even when applied to man. It is a benefit springing out of the liberality and freeheartedness of the giver, and bestowed without any preceding claim on the part of the receiver, or any subsequent compensation by him in view. Applied to God in the New Testament and in theology, it denotes the free outcoming of His love to man: and when man, on the other hand, is said to be in a state of *grace*, it implies that he is in the reciprocity of this divine love. The apostle Paul draws a sharp contrast (Rom. xi.) between *charis* and *erga* (Gr. works), as mutually excluding one another, when considered merely as the *ground* of man's salvation.

Theologians have distinguished grace into *common or general*, and *special or particular*. *Common* grace is supposed to denote the love which God has to all men, and the light of nature and of conscience which they all receive and possess. *Special* grace is the love which God has for His elect people, and by which He saves them from their sins. This *special* or *saving* grace is sometimes also divided in various ways, and spoken of as electing, justifying, sanctifying grace; also in respect of man, as *imputed* grace—i.e. the grace of Christ's righteousness imputed or reckoned to the account of those that believe on Him, and as *inherent* grace,—i. e., the grace of holy and pious dispositions wrought within the heart by the Spirit of God. Grace is spoken of also as *efficacious* and *irresistible*, and the relation in which the elect or believing people stand to God is represented as a *covenant of grace*, in contrast with the primitive relation which Adam bore to his Maker before the fall, which is called a *covenant of works*: see COVENANT, in Theology.

All these theological distinctions have arisen in the course of extended argument and discussion on divine truth. They are of human wisdom, and are not found—at least in their more technical sense—in the New Testament. The *charis* or grace of the apostle Paul is not a logical distinction but a spiritual and vital fact. It is the loving aspect of God manifested in His Son Christ Jesus toward the sinner—toward all sinners, whereby all who confess and forsake their sins have free access into His favor, and receive the 'adoption of sons.' The technical distinctions of theology doubtless have value in their proper place, i.e. as merely human science: thus limited and rightly used, they mark the course of past controversy—they give precision to theological thought—and when not allowed to deface the simple and august proportions of God's revealed truth, they may teach needful and important lessons.

GRACES, *grās'ez*: in ancient mythology, goddesses of grace, favor, and gentleness, the sources of all grace and beauty. They appear in Homer in indefinite numbers as the attendants of Cytherea (Venus), whom it is their office to bathe and anoint. Hesiod and most other poets mention three G.—Aglaia, Thalia, and Euphrosyne, daughters of Zeus and Eurynome. Their worship is said to have been

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introduced into Greece first at Orchomenos, in Bœotia, by Eteocles. The Lacedæmonians and Athenians originally recognized only two Graces, called, by the former, Phænnæ and Kleta; by the latter, Hegemone and Auxo. In the early ages, the G. were represented in elegant drapery; at a later period, slightly draped or entirely nude. They appear holding each other by the hand, or locked in each other's embrace.

GRACIAS Á DIOS, *grá'sē-ás á dē'ōs*, CAPE: headland on the Mosquito coast, extreme e. end of Honduras, Central America; lat. 14° 55' n., long. 83° 15' w.; at the mouth of the Segovia river. It was discovered by Columbus on his fourth voyage, and in gratitude for having found a smooth harbor after much beating against the winds and struggling with adverse currents he named it 'Thanks to God.'

GRACILARIA, n. *grās-ī-lār-ī-a* [L. *gracilis*, thin, slender]: typical genus of *Gracilariide*, a family of moths, group *Tineina*.

GRACILIS, n. *grās-ī-līs* [L. thin, slender]: in *anat.*, slender muscle of the thigh, connecting it with the trunk; called also abductor gracilis.

GRACIOSA, *grá-sē-ō'sá*: one of the Azores Islands (q.v.), seventh of that group in population and importance.

GRACK'LE: see GRAKLE.

GRADATION, n. *grā dā shūn* [F. *gradation*—from L. *grādātiōnem*, the making a series of steps—from *grādus*, a step]: a regular advance from one degree or state to another; regular progress step by step; order; series. GRADATION'AL a. according to gradation. GRADATION'ED, a. -shūnd, formed by gradation. GRADATORY, n. *grād-ā-tēr-ī*, the steps from the cloisters into the church; a proceeding step by step. GRADE, n. *grād* [F. *grade*, a degree—from L. *grādus*, a step]: a degree or rank in order or dignity; a step or degree in any series: V. to cut or reduce to the proper levels as a canal or road. GRA'DING, imp. GRA'DED, pp. GRA'DIENT, n. -dī-ènt, the slope or incline, frequently of a railroad; in *heraldry*, applied to a tortoise walking. GRADUAL, a. *grād-ū-āl* [F. *graduel*—from L. *gradūālis*—from *grādus*]: advancing step by step; proceeding by degrees; regular and slow; in *liturgy* (see below). GRAD'UALLY, ad. -lī, by degrees; step by step. GRAD'UALITY, n. -ī-tī, progression by degrees. GRAD'UATE, n. -ū-āt [mid. L. *graduātus*, one who has received an academical degree]: one who has received an academical degree: V. to divide any space into small regular intervals or parts; to mark differences; to change gradually; to receive or take a degree from a university. GRAD'UATING, imp. GRAD'UATED, pp. GRADUATESHIP, n. the state of being a graduate. GRADUATION, n. -ā-shūn [mid. L. *graduātiōnem*]: regular progression; act of marking or dividing into degrees (see below); act of receiving an academical degree. GRADUATOR, n. -tēr, an instrument for dividing lines into equal parts; an instrument used in vinegar-making. GRADUS, n. *grād-ūs* [L.]: a dictionary for Latin or Greek

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verse-making, the full title being *Gradus ad Parnassum*, a step to Parnassus, the abode of the Muses.

GRADE, GRADIENT, GRADUAL, GRADUATE, GRADUS, etc.: see under GRADATION.

GRAD'UAL, in the Liturgy of the Roman and other Western Churches: that portion of the mass between the epistle and the gospel, consisting of a few verses of Holy Scripture, usually from the Psalms. It was called originally 'Responsum,' or 'Cantus Responsorius;' but, probably for distinction from other portions of the service called by the same name, its present appellation has been substituted. The name 'gradual' is derived from the place at which this response was chanted, which was either the ambo or chanting pulpit approached by 'steps' (*gradus*), or the 'steps' themselves, whether of the ambo or of the altar. Originally, as we find from St. Augustine, the G. response consisted of an entire psalm, and in the mass or the first Sunday in Lent the entire xci. (xc. in the Vulgate) psalm is chanted. In the Ambrosian Liturgy, the G. is partly from the Old and partly from the New Testament. Strictly, only the first sentence was called the G.; the remainder was called the 'verse.' The G. in the Roman Liturgy, is always followed by the 'alleluia,' except in penitential time, when a slow and mournful chant, called the 'Tract,' is substituted: see GRADUALE.

GRADUALE, *gràd-ū-ā'lē*: the music of the Gradual (q.v.) in the Roman Liturgy. It is performed during mass after the epistle is read, and it is said to have been used from the earliest times to allow the officiating priest time to take his place on the steps of the reading-desk, or on the steps of the gospel side of the altar. The music is according to the character of the words, and may be either aria, duet, or chorus. The composition must not be long, as the priest has little ceremony to go through during its performance. The best specimens of the graduale are Haydn's *Insanæ et Vanæ Curæ*; *Solve Regina*; or Mozart's *Misericordias Domini*; *Sancta Maria*; *De Profundis*, etc.

GRAD'UAL PSALMS, or 'PSALMS OF THE STEPS,' or 'SONGS OF DEGREES': in both the Hebrew and the Christian service-books, the fifteen psalms, cxx.-cxxxiv. (cxix.-cxxxiii. in the Vulgate). The origin of the name is uncertain. The rabbins trace it to a fabulous incident connected with the building of the second temple; others explain it as an allusion to the 15 steps by which (Ezekiel xl. 22-26) the temple was reached; others, again, regard these psalms as containing a prophetic allusion to the return from captivity, which, in the language of the Jews, was 'a going up,' psalm cxxxiv. being the full outburst of exultation at the accomplishment of that great object of hope and longing. These psalms, in the Roman Church, form part of the office of each Wednesday during Lent.

GRADUATION: art of dividing mathematical, astronomical, and other instruments. The simplest problem in G. is the dividing of a straight line, such as an ordinary

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scale or rule. This is commonly done by copying from a standard scale, for which purpose a dividing square and a suitable knife for cutting the divisions are used. The dividing square is a hard steel straight-edge, with a shoulder at right angles like a carpenter's square. This is made to slide along the standard scale, and halt at each required division, when a corresponding one is cut upon the rule, etc., by using the steel straight-edge as a guide to the knife. The *original graduation* of a straight line into equal divisions, as in making a first standard scale, etc., is performed on the principle either of *bisection* or of *stepping*. In bisecting, the points of a beam-compass (see COMPASS) are adjusted to nearly half the length of the line to be divided; one point is then placed at one end of the line, and a faint arc struck toward the middle: this is repeated at the other end; the small distance between these arcs is then carefully bisected with the aid of a fine pointer and magnifier, which gives an accurate half of the line. The half thus obtained is again bisected in like manner, and these quarters bisected again, and so on until the required subdivision is attained. Stepping is performed with delicately pointed spring-dividers, which are set at once as nearly as possible to the opening of the small division required; then the points are made to step on, leaving at each step a very fine dot; and when it is found that the last dot either falls short of or overpasses the end of the line, the opening is adjusted accordingly, until perfect accuracy is obtained. Thus, if a line were divided into a thousand parts, and each division were $\frac{1}{1000}$ too long or too short, the error would amount to a whole division at the end of a thousand steps. The method of bisection is practically the most accurate, and has been adopted by eminent artists in original graduation. Curved lines are divided on this principle. The chord of an arc of 60° is equal to the radius; therefore, the opening of the compasses required for striking the circle gives this arc at once to start with. An arc 90° , or a quadrant, is obtained by bisecting 60° , and adding the half. By continual bisection of 60° , the finer graduations are produced. The amount of care, patience, skill, and delicacy of touch required in the original G. of important astronomical instruments, is such, that not above one or two men in a generation have been found competent to the task, and these have become almost as famous as the astronomers who have successfully used the instruments. Graham, when dividing the mural quadrant for the Greenwich Observatory, measured his larger chords from a scale made for the purpose; but before laying these down on the quadrant, he left the scale, beam-compasses, and quadrant to stand for a whole night, in order to acquire exactly the same temperature: neglect of this precaution would have involved a notable amount of error. The necessity of such extreme accuracy arises from the application made of these divisions. When, for example, the mariner determines his latitude by taking the meridian altitude of the sun, the graduated arc of the limb of the sextant or quadrant that he uses represents, practically, the

curved surface of the globe, and the error is magnified just to the same extent as the radius of the earth exceeds that of the divided arc of the instrument.

The methods of *original graduation* above described are not practically adopted except for the largest and most important astronomical or geodesical instruments. Ordinary instruments are graduated by dividing plates or engines which copy and adapt a set of already existing divisions. The dividing-plate for common purposes, such as dividing compass rings, etc., is a divided circle with a steel straight-edge, made movable on the axis or arbor of the plate in such a manner that its edge during every part of its revolution shall fall in the exact line from centre to circumference. The ring, protractor, or other instrument to be divided, is clamped upon the plate with its centre exactly coinciding with that of the plate, and the straight-edge is moved round, and made to halt at the required divisions on the circumference of the dividing-plate, and by using the steel straight-edge as a guide, corresponding divisions are marked off on the concentric arc of the instrument to be divided. The *dividing-engine* is a very complex machine, requiring the greatest accuracy and care in its construction; so much so, that the possession of a good one may sometimes afford a good income, with a moderate amount of labor in using it. Among the most celebrated dividing-engines may be mentioned those of Ramsden, Troughton, Simms, and Ross. Their principal parts consists of a large circle divided with extreme care by original graduation. This wheel is racked on its edge with teeth as equal and accurate as the divisions; a very carefully constructed endless screw works in these teeth, and is moved through any given number of revolutions, or any measured fraction of a revolution, by means of a treadle or other suitable power, thus making the requisite steps for each division; another part of the machine cutting a fine line at the moment of the halt of each step. These divisions are cut upon an arc of silver, gold, or platinum, which is soldered or inlaid upon the limb of the instrument, the precious metals being used, on account of the oxidation to which common metals are liable.

GRADY, HENRY WOODFEN: an American journalist; 1851-1889, Dec. 23; b. in Athens, Ga. During the latter part of the civil war he served in the Confederate army. He later secured a place on the staff of the *Atlanta Herald*, and became correspondent of the *New York Herald* in Georgia. The influence of his writings added much to the development and prosperity of the "New South." He also served on the editorial staff of the *Atlanta Constitution*. He was the best known of Southern editors and orators.

GRÆCIA, MAG'NA. See MAGNA GRÆCIA.

GRÆVIUS, grā'vê-ûs (or GRÄFE, grā'fêh, or GREFFE, rgëff'fêh), JOHANN GEORG: 1632, Jan. 29—1703, Jan. 11; b. Naumberg, Saxony: classical scholar. He was educated at the Gymnasium of Pforta, and began studying law in the Univ. of Leipsic. where, in his 18th year, he

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made the acquaintance of Gronovius at Deventer, and was led to give up preparation for a legal career. He studied philology with Gronovius, with Hensius at Leyden, and Morus and Blondel at Amsterdam. While in Amsterdam he changed from the Lutheran to the Ref. Church. In 1656 he was appointed by the Elector of Brandenburg prof. of belles-lettres in the Univ. of Duisburg; 1658 succeeded Gronovius in the Deventer Athenæum; 1662 was appointed prof. of rhetoric in the Univ. of Utrecht; and 1667 prof. of history and politics there. He achieved such fame that the universities of Heidelberg, Leyden, and Padua sought to secure his services but in vain, and Louis XIV. and other sovereigns bestowed special honors on him. His publications comprised editions of Hesiod, Cicero, Catullus, Tibullus, Propertius, Suetonius, and Flavius, and *Thesaurus Antiquitatum Romanorum*, 12 vols. (Utrecht 1694-99) and *Thesaurus Antiquitatum et Historiarum Italie*, published after his death.

GRAF, *gräf*: German equivalent for Count (q.v.), *Comte*, *Comes*, and for (English) Earl (q.v.). The etymology of the word is disputed, but the most probable conjecture is that it springs from the same root with the modern German *raffen* and the Anglo-Saxon *reafan*, to snatch or carry off hastily; and also with our words *reave*, *grere*, and the last syllable of *sheriff*. If this view be correct, the G., in all probability, was originally a fiscal officer, whose duty it was to collect the revenue of a district. The title appears first in the *lex salica* (compiled in the 5th c.), under the Latinized form of *Grafio*; later, the office is often designated by the Latin equivalent of *Comes*. Charlemagne divided his whole kingdom into Graf-districts (*Grafengaue*) or counties, each of which was presided over by a graf. The people were in the habit of appointing a representative called the *Cent-graf* to attend to their interests with the G., and probably, if necessary, to appeal from his decisions to the central government. There were also, the *Stall-graf*, or stable-graf; the *Comes Stabuli*, or constable of later times; the *Pfalz-graf* (*Comes Palatii*), who presided in the domestic court of the monarch, which as such was the highest court in the realm; the *Send-graf*, who was sent as an extraordinary deputy of the king to control the ordinary *Gau-grafen*; and lastly, the *Mark-graf*, or marquis, on whom the important duty of defending the border-lands devolved. When feudal offices became hereditary, and the power of the princes of the empire, secular and ecclesiastical, developed itself, the G. gradually ceased to be an officer possessed of real power, and became merely a titled noble. In Germany, in modern times, there are two classes of grafs: those who are representatives of the old grafel families, who held sovereign jurisdiction immediately under the crown (*landeshoheit*), and who still belong to the higher nobility, their chief taking the title *Erlaucht* (Illustrious); and those who form the highest class of the lower nobility. The former is a very small, the latter, an extremely numerous class.

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GRÄFE, *grä'fēh*, ALBRECHT VON: oculist: 1828, May—1870, July 18; b. Berlin; son of KARL FERDINAND VON G. He studied mathematics, natural science, and medicine, and applied himself particularly to ophthalmology in Prague, Vienna, Paris, and Berlin. In 1850 he returned to Berlin, and established a private institution for the treatment of the eye; 1853 was appointed teacher of ophthalmology in the Univ. of Berlin, 1856 extraordinary prof., and 1866 ordinary prof. there; and 1855 founded the *Archiv für Ophthalmologie*, to which he contributed his most important technical papers. His discovery of the methods of treatment for glaucoma—previously deemed incurable—and for the removal of cataract, gave him wide renown. His chief papers were *Physiology and Pathology of the Oblique Muscles of the Eyeball*; *Double Vision after Operations for Strabismus*; *Diphtheritic Conjunctivitis*; *Effect of the most Refrangible Solar Rays upon Sensation*; *Treatment of Glaucoma by Iridectomy*; and *Cerebral Causes of Blindness*.—His nephew, ALFRED KARL (b. 1830, Nov. 23), was his asst. several years, founded an ophthalmic institute, and was the first to secure recognition in the Prussian universities for the study of the eye as a special science. He graduated at Halle, and was prof. there.

GRÄFE, KARL FERDINAND VON: 1787, Mar. 8—1840, July 4; b. Warsaw: surgeon. He graduated in medicine at the Univ. of Leipsic 1807, was the same year appointed private physician to the Duke Alexius of Anhalt-Bernburg, became prof. of surgery in the Univ. of Berlin 1811, and during the war with Napoleon was supt. of military hospitals. He returned to the Univ. on the conclusion of peace, and was appointed a member of the army medical staff, and director of the Frederick-William Institute, and of the Medico-Chirurgical Acad. In his special line of surgery he invented new instruments, and discovered new methods of treatment. He died in Hanover while preparing to operate on the eyes of Crown Prince George.

GRAFENBERG, *grä'fēn-bērēh*: little village in Austrian Silesia, an extension of the town of Freiwaldau toward the n.; noted as the spot where the water-cure (see HYDROPATHY) was introduced about 1828 by Priesnitz. The village is 1,200 ft. above the level of the Baltic Sea; the climate is inclement, the vegetation scanty. It extends from the valley, half way up the Gräfenberge. The lodgings for visitors are partly in the buildings connected with the baths, partly scattered on the declivity of the hill, or in Freiwaldau.

GRAFF, v. *gräf*: the old spelling of GRAFT, which see.

GRAFF, *gräf*, FREDERICK: 1775, Aug. 27—1847, Apr. 13; b. Philadelphia: engineer. He learned the carpenter's trade, studied drawing, and became associated with H. B. Latrobe in erecting the first waterworks in Philadelphia 1795. He was chosen supt. and engineer of the works 1805, and 1811 began building the great works at Fairmount. He substituted iron pipes for the wooden ones previously used, and devised a variety of mechanical con-

GRAFFITI.

trivances including fire-plugs and stop-cocks. His success at Fairmount led to requests for his aid from nearly 40 corporations in the United States about to construct waterworks. His labor on the Philadelphia water system extended over 42 years, and a handsome monument was erected in his honor at Fairmount.

GRAFFITI, *grá-fē tē* [Ital. *graffito*, a scratching]: class of ancient inscriptions to which attention has recently been called, and of which several collections have been made. The *graffito* is a rude scribbling or scratching with a stylus, or other sharp instrument, on the plaster of a wall, a pillar, or a door-post. Such scribblings are frequently found on the substructions of Roman ruins, as in the Golden House of Nero, the palace of the Cæsars, and the Palatine, and in still greater numbers in Pompeii and in the Roman catacombs. Their literary value, of course, is very slight; but as illustrating the character and habits of a certain class of the ancient Romans, and what may be called the 'street-life' of the classic period, they are deserving of study. A small selection of Pompeiian G. was published 1837 by Dr. Wordsworth; but the most popular collection is that of Padre Garrucci, a Neapolitan Jesuit, published, Paris 1856. Greek G. occasionally are found upon Roman ruins; but G. usually are in Latin, and

.ΤΑΔΕΤΜΑ ΛΙΤΥΙ Ξ

Fig. 1.

in a few instances at Pompeii, in the ancient Oscan. Some are idle scribblings, such as we may suppose some loiterer to indite at the present day; thus, some lounge at the door of a wine-shop at Pompeii amuses himself by scratching on the door-post the tavern-keeper's name—*Taverna Appii* ('Appius's Tavern'), fig. 1. In other cases we meet with some scrap of rude pleasantry or scandal, such as frequently defaces the walls of our own towns; thus, *Auge amat Arabienum* ('Auge is in love with Arabienus'), fig. 2. Many rude sketches also are found on the

ΑΥΓΑΝΝΑ ΚΡΑΘΙΕΛΛΑΜ

Fig. 2.

walls, some evidently caricatures, others seriously meant, and grotesque from the extreme rudeness. Many of the subjects of those sketches are gladiatorial: here is a specimen (fig. 3):

By far the largest proportion of the G. are from Pompeii, but many have been discovered at Rome also, and some are very interesting. One discovered by Father Garrucci 1856, in a subterranean chamber of the palace of the Cæsars, possesses a strange and awful interest, as a memorial of the rude early conflicts of paganism with the rising Christian creed. It is no other than a pagan caricature of the Christian worship of the Lord on the cross, and con-

GRAFF-REINET—GRÄFRATH.

tains a Greek inscription descriptive of one Alexamenus as engaged in worshipping his God. The chamber in which it was found appears to have been a waiting-room for slaves



Fig. 3.

and others of inferior grade. The G. of the catacombs almost all are sepulchral, and are full of interest as illustrating early Christian life and doctrine.—See *Edin. Rev.* CX.; Zangemeister, *Inscriptiones Parietariæ Pompeianæ*, etc. (in the *Sylloge Inscr. Lat.*).

GRAFF-REINET: see GRAAF-REINET.

GRÄFRATH, *gräfrāt*: town of Rhenish Prussia, govt. dist. of Düsseldorf, circle of Solingen, on the river Itter, 14 m. e. of Düsseldorf. It has manufactures of iron, steel, chemicals, cotton, and ribbons. Pop. about 6,000.

GRAFT—GRAFTING.

GRAFT, n. *graft* [OF. *graffe*, a sort of pen or pencil: F. *greffe*, a slip or shoot for grafting: Dut. *greffe*, a cutting for grafting or planting in the ground, a style for writing—from L. *graphium*, a pointed instrument for writing on waxen tablets]: a small shoot or scion cut from one tree and inserted into a part of another: V. to insert a cutting of one tree into a part of another in such a way that they unite; to insert anything into a body to which it did not originally belong. **GRAFTING**, imp.: N. the act or art of inserting grafts or scions. **GRAFTED**, pp.: **ADJ.** inserted on a foreign stock. **GRAFTER**, n. one who.

GRAFTING: in horticulture, a method of propagating specific varieties of fruits or plants. It consist in placing in contact portions of two different plants, or different parts of the same plant, in such a way that organic union shall be secured. It can be successfully performed on fruit and timber trees, and on herbaceous plants; but in practice is almost confined to the propagation of choice varieties of fruit. G. has been in extensive use from very early times. The ancient Romans were familiar with 20 different methods. It is attended with little difficulty, and, under favorable circumstances, if well done is very likely to prove successful. Budding (q.v.) accomplishes the same purpose by affixing a bud from one plant upon the stem or branch of another, but it is not applicable to so large trees as G., and in many other cases is not as desirable a method of propagation.

Fruit-trees can be easily and rapidly multiplied by planting the seeds, but this method does not insure the perpetuation of the specific variety, as seedlings are almost invariably unlike the parent stock. It requires 10 to 20 years for seedlings to come into bearing, but shoots therefrom grafted into large trees produce fruit in three to five years. In nursery grounds (see **NURSERY**) seeds are planted in rows. When one or two years old the shoots are either grafted or budded. Thus the grower can secure as many trees as he wants of any particular kind, and is enabled to tell in advance what variety of fruit each tree will produce. By placing the weaker and more delicate varieties on vigorous stocks a greater degree of hardiness is secured. G. is useful also when it is desirable to change and improve the variety of fruit produced by trees which have come into bearing.

While G. can be made successful on a large variety of trees and plants it is necessary that the stock (the tree or plant to be grafted), and the scion (portion of the tree or plant that is to be combined with the stock), should belong to the same natural order. The more closely they are related the more readily the desired union is effected. The apple grafted on the apple is entirely successful, while on the pear the apple scion makes only a weak growth. The cherry grafted on the plum is short-lived and practically useless, but each may be successfully grafted on its own kind. In order to secure dwarfed fruit-trees the scions are placed in naturally small and slow-growing trees. The apple is dwarfed by being worked on the Paradise stock

GRAFTING.

and the pear, of which some choice varieties thrive better as dwarfs than as standards, by being placed on the quince.

About 100 different methods of G., each of which is fairly successful, are known; but only a very few are in common use. The principle is the same in all. Whatever method is adopted, it is essential to success that the parts be joined in such a manner that the space between the inner bark and wood of each shall exactly meet and form an unobstructed avenue for the circulation of the sap of the stock through the scion.

Whip G. is probably the method most extensively employed. It is, practically, a splice of the scion upon the stock, and by offering a comparatively large surface of contact is well adapted for use on small stocks and roots. By an upward sloping cut the stock is taken off near the ground. A slit is then made, about one-third the way down the slope from the top, in order to form a kind of tongue or shoulder to support the scion. The lower end of the scion is then sloped to fit the stock, a slit is made to match the one which it is to meet, the cut surfaces are pressed together so that, on one side at least, the inner bark of each just meets and the tongues formed by the slits join each other. A strip of cloth is wound closely around the junction, and thoroughly covered with grafting-wax formed of rosin, tallow, and beeswax, in equal proportions, melted together and worked until the mass becomes tough and pliable. The covering is necessary in order to exclude air and moisture, prevent the drying of the scion and the loss of sap from the stock. After the wound has healed, the cloth should be loosened. When the stock and scion are of exactly the same size the slit is often omitted. This is called splice-G., and in other respects is performed the same as the preceding. In Saddle G. the end of the stock is cut in the form of a wedge and the scion in a reverse manner. Cleft G. is the best method for large trees. Branches from one

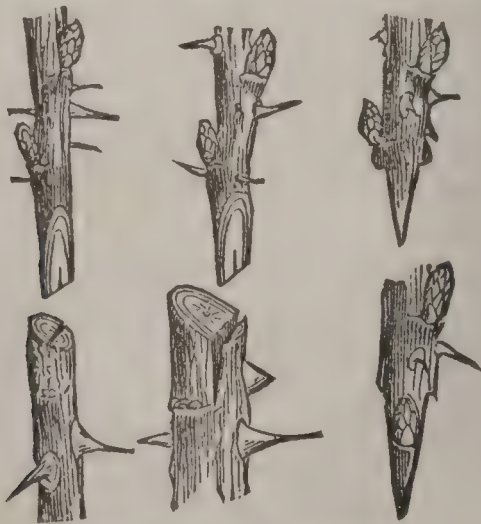


Fig. 1.—Cleft-grafting.

to three inches in diameter are cut off with a fine-toothed saw. The end of the stock is pared smooth, split with a grafting-knife, and the sides are held apart by a wedge,

GRAFTING.

on the back of the knife, which is driven into the cleft. The scion, sharpened like a wedge about an inch and a half from the lower end, and a little thicker on the side having the lowest bud and which is to be placed outward, is inserted in the cleft so that the inner bark of stock and scion meet. The wedge is removed, and the end and sides of the stock to a point below the cleft are heavily covered with wax. Two scions are usually placed in each cleft but if both grow one is removed after the first season. In this way the variety of fruit produced by a mature tree can be quickly changed, but as it involves severe pruning it is best to graft only part of it in one season. In Root G. the roots

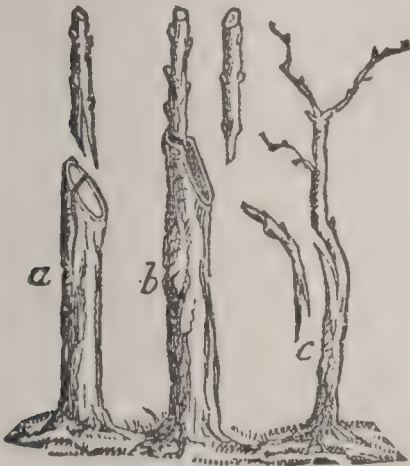


Fig. 2.

a, tongue-grafting; *b*, cleft-grafting; *c*, tongue-grafting (side-grafting) as practiced in wall trees to fill up vacancies without cutting over the head of the stock.



Fig. 3.—Shoulder-grafting.

of small trees are cut into pieces three or four inches long, and scions affixed either by the whip, splice, or saddle method, and held in

place by paper which has been heavily coated with grafting-wax. The roots are then planted in boxes of fine earth, all but the upper buds of the scions being covered. When the plants are united the plants may be set in the garden or field.

In cold regions scions should be cut in the autumn, packed in moist earth, placed in a dark cellar, and protected from mice. Straight and thrifty shoots should be taken from the centre or top of young and vigorous trees, tied in packages, and properly labelled with the name of the variety. When wanted for use they are cut into pieces three or four inches long, each piece having from two to five buds. Mature wood of the previous season's growth is usually taken, but wood two years old is sometimes preferred. If not cut until spring, scions must be taken from the tree before the buds begin to swell. In cutting and fitting the scions and stocks, sharp and thin-bladed knives and fine-toothed saws should be used. The plum and cherry must be grafted very early in the spring. The apple and pear thrive better when the weather is mild, and may be grafted until the leaves are put out, but the scions must be kept dormant until used.

GRAFTON—GRAHAM.

GRAFTON, *grăfton*: town in Worcester co., Mass.; on the Boston and Albany rr.; 9 m. s.e. of Worcester, 38 m. w. of Boston. It contains 5 churches, 1 nat. bank (cap. \$75,000) and one savings bank, high school, weekly newspaper, and extensive manuf. of boots and shoes. Good water-power is supplied by the Blackstone river, which drains the tp. of the same name. Pop. tp. (1880) 4,030; (1890) 5,002; (1900) 4,869.

GRAGNANO, *grăn-yă no*: town of Italy, province of Naples, two m. s.e. of Castellamare; on the flank of Mount Gaurano, from which it is said to have derived its name. The origin of this town dates from the great eruption of Vesuvius A.D. 79, when the inhabitants of Stabia, in dread of the vicinity of the volcano, fled from their dwellings, and sought refuge on the mountain of Gaurano. G. lies in a beautifully picturesque neighborhood, which produces excellent wines, and has good macaroni manufactories. Pop. abt. 8,000.

GRAHAM, *gră'am*, CHARLES KINNAIRD: civil engineer: 1824, June 3—1889, April 15; b. New York. He was appointed midshipman in the U. S. navy 1841, served with the fleet during the Mexican war, resigned and began studying engineering in New York 1848, and was appointed constructing engineer at the Brooklyn navy yard 1857. At the beginning of the civil war he entered the army, became col. of the Excelsior brigade, brig.gen. 1862, Nov., was severely wounded at Gettysburg, commanded a gunboat flotilla on the James river, took part in the assault on Fort Fisher, and was brevetted maj.gen. of vols. 1865, Mar. 13. Returning to New York he resumed engineering, was chief engineer of the dept. of docks 1873-5, surveyor of the port 1878-83, and naval officer 1883-5.

GRAHAM, FAMILY OF: see MONTROSE.

GRAHAM, ISABELLA: 1742, July 29—1814, July 27; b. Lanarkshire, Scotland: philanthropist: she was a daughter of John Marshall, received a thorough education, founded the Penny Soc., afterwards the Soc. for the Relief of the Destitute Sick; married John Graham, M.D., of Paisley, and went with him and his regt. to Canada. After serving there 4 years Dr. G. was ordered to Antigua, where he died 1774. His widow returned to Scotland, but removed to New York 1789, and devoted herself to philanthropic labors. She established societies for the relief of widows and orphans and the promotion of industry, aided in organizing in New York the Magdalen Soc., the first missionary soc., the first Sunday school for adults, and the first missionary prayer-meeting, and was the first who systematically visited sick women in the hospitals and prisons and distributed Bibles and tracts among the sick, poor, and ignorant.

GRAHAM, *gră'am*, Sir JAMES ROBERT GEORGE, The Right Honorable, of Netherby, Cumberland, England: statesman: 1792, June 1—1861, Oct. 25; eldest son of Sir James, the first baronet, by Lady C. Stewart, e'dest daughter of the seventh Earl of Galloway. G. was educated at Westminster School, and at Queen's College, Cambridge.

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He was private sec. to Lord Montgomerie, British minister in Sicily; and then at the same post, with Lord William Bentinck, and continued in a military position with the latter, who became commander-in-chief in the Mediterranean. In this capacity he negotiated with Murat at Naples, the armistice which separated that general from Napoleon. 1818-20 he was returned to parliament for Hull on whig principles; 1824, he succeeded to the baronetcy on the death of his father; 1826, he was returned for Carlisle as a whig, and a warm supporter of Rom. Cath. emancipation; 1830, Earl Grey offered him the post of first lord of the admiralty, with a seat in the cabinet. At this time he was very popular with the extreme liberal party. In 1834, he seceded from the govt., and though refusing to join the Peel administration in that year, gradually approximated to Peel's politics; and 1841 became sec. of state for the home dept. under Sir Robert Peel, who declared that G. was the ablest administrator that he had ever known. In 1844 he incurred great obloquy by issuing a warrant for opening the letters of Mazzini, and communicating information thus obtained to the Austrian minister. He also roused great displeasure n. of the Tweed by his high-handed dealing with the Scottish Church during the troubles which ended in the disruption, and the formation of the Free Church. He gave Peel warm support in carrying the Corn-law Repeal Bill, and resigned office with his chief as soon as that great measure was carried. At the death of Peel 1850, he became leader of the Peelite party in the lower house, and led the opposition to the Ecclesiastical Titles Bill. 1852-55 he was in the coalition ministry of the Earl of Aberdeen, in his old office of first lord of the admiralty. G. had fine personal presence, and a calm and impressive delivery in debate; but was accused of political fickleness, having been whig in youth, conservative in middle life, and radical in old age.

GRAHAM, JOHN (Viscount DUNDEE): 1643-89; eldest son of Sir William G. of Claverhouse, head of a branch of the noble family of Montrose, in Forfarshire, Scotland. He entered St. Andrews Univ. 1665, served in the French army 1668-72, and entered the Dutch service as cornet in the Prince of Orange's horse guards. Returning to Scotland, he obtained (1678, Feb.) an appointment as lieut. in a troop of horse commanded by his cousin, third Marquis of Montrose. At this time, the govt. of Charles II. was engaged in its wild attempt to force episcopacy upon the people of Scotland. A system of fines and military coercion had been carried on for years against all Nonconformists; conventicles and field-preachings were prohibited, penalties were inflicted on all who even harbored the recusants, and the nation lay at the mercy of informers. Maddened by oppression, and fired by a fierce zeal for the Covenant, the people flew to arms; but their efforts were irregular and detached, and each successive failure aggravated their sufferings. Many were put to death, the jails were filled with captives, and those who fled were outlawed, and their property seized. In this miserable service G. engaged.

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He encountered an armed body of Covenanters at Drumclog, 1679, June 1, but was defeated, and fled from the field. Three weeks afterward he commanded the cavalry at Bothwell Bridge, where the royal forces, under the Duke of Monmouth, achieved an easy victory over the Covenanters. In this battle, three or four were killed while defending the bridge, but in the pursuit 400 were cut down (chiefly by G.'s dragoons), and 1,200 surrendered unconditionally, to be afterward treated with atrocious inhumanity. These affairs at Drumclog and Bothwell are the only contests that can even by courtesy be called battles in which G. was engaged in Scotland previous to the abdication of James II. They gave no scope for valor, and displayed no generalship. In his other duties—pursuing, detecting, and hunting down unyielding Covenanters—G. evinced the utmost zeal. He rose to the rank of maj.-gen., was sworn a privy councilor, had a gift from the crown of the estate of Dudhope, and was made constable of Dundee. In 1688, on the eve of the Revolution, he was raised to the peerage by James II. as Viscount Dundee and Lord Graham of Claverhouse. When the bigotry of James had driven him from the throne, Dundee remained faithful to the interests of the fallen monarch. He was joined by the Jacobite highland clans and by auxiliaries from Ireland, and raised the standard of rebellion against the government of William and Mary. After various movements in the north, he advanced on Blair in Athol, and Gen. Mackay, commanding the govt. forces, hastened to meet him. The two armies confronted each other at the Pass of Killiecrankie, 1689, July 27. Mackay's force was about 4,000 men; Dundee's, 2,500 foot, with one troop of horse. A few minutes decided the contest. After both armies had exchanged fire, the Highlanders rushed on with their swords, and the enemy instantly scattered and gave way. Mackay lost by death and capture 2,000 men, the victors, 900. Dundee fell by a musket-shot while waving on one of his battalions to advance. He was carried off the field to Urrard House, or Blair Castle, and there died.

The character and services of Dundee have been on one hand greatly exaggerated, and on the other blackened by party spirit. With the Jacobites, he was the brave and handsome cavalier, the last of the great Scots and gallant Grahams. With the Covenanters, he was 'bloody Claverse,' the most cruel and rapacious of all the mercenary soldiers of that age. He was neither the best nor the worst of his class. He simply obeyed his military superiors, and these at that time in Scotland were low-minded, cruel, and relentless. Thus his work was detestable. See *Memorials and Letters illustrative of the Life and Times of John Graham of Claverhouse*, by Mark Napier (1862).

GRAHAM, JOHN HODGES: 1794, Mar. 9—1878, Mar. 15; b. Vt.: U. S. naval officer. He was appointed midshipman in the navy 1812, June 18, was commissioned lieut. 1817, Mar. 5, promoted capt. 1849, Mar. 7, retired 1855, and promoted commodore on the retired list 1867,

GRAHAM—GRAHAME.

Apr. 4. He took part in a notable expedition against a strong British post opposite Black Rock, N. Y., in the war of 1812, and was commander of McDonough's flagship in the battle of Lake Champlain.

GRAHAM, SYLVESTER: 1794-1851, Sep. 11; b. Suffield, Conn.: reformer. He spent several years teaching; entered Amherst College to prepare for the ministry 1823, but did not complete the course; was ordained a Presb. clergyman 1826, and began his temperance and dietetic reform work 1830. He conceived the great panacea for intemperance to be a purely vegetable diet, and the remainder of his life was spent in writing and lecturing on that theory, which he subsequently elaborated till it was made to apply to all forms of disease. He introduced *Graham Bread*, made from unbolted wheat flour.

GRAHAM, THOMAS: celebrated chemist: 1804, Dec. 21—1869, Sep. 16; b. Glasgow. Having studied at Glasgow and Edinburgh, he became, in 1830, prof. of chemistry at the Andersonian Univ., and continued in that office till 1837, when he succeeded Dr. Turner in the chemical chair of Univ. College, London. In 1855, he was appointed master of the mint, and resigned his professorship. From 1831, in which his memoir, 'On the Formation of Alcoates, Definite Compounds of Salts and Alcohol,' appeared in *Transactions of the Royal Soc. of Edinburgh*, till his death, he was constantly publishing important contributions to chemistry. Among the most important are: 'On the Law of Diffusion of Gases' (*Tr. R. Soc. Edin.* 1834); 'Researches on the Arseniates, Phosphates, and Modifications of Phosphoric Acid' (*Phil. Tr.* 1833); 'On the Motion of Gases, their Effusion and Transpiration' (*Ibid.* 1846, 49); 'On the Diffusion of Liquids' (*Ibid.* 1850, 1); 'On Osmotic Force' (*Ibid.* 1854); 'Liquid Diffusion Applied to Analysis,' and 'On Liquid Transpiration in Relation to Chemical Composition' (*Ibid.* 1861). In addition to these memoirs, he brought out an excellent treatise on chemistry. G. was one of the founders and first president of the Chemical and the Cavendish Societies, was a fellow of the Royal Soc. and was frequently placed by govt. on important scientific commissions.

G. was remarkably persistent, original, and successful in his study of the laws of atomic motion, and of the molecular mobility of gases. He originated the now well-known 'Graham's law'—*that the diffusion rate of gases is inversely as the square root of their density*—an important principle now seen to be included under the fundamental law of motion.

GRAHAME, grā'am, JAMES: Scottish poet: 1765, Apr. 22—1811, Sep. 14; b. Glasgow; son of a legal practitioner. He was educated at the Univ. of Glasgow. He removed to Edinburgh 1784, studied law, and was admitted to the Faculty of Advocates, 1795; but soon withdrew from professional practice and applied himself to poetry. He took orders in the Church of England, 1809, May 28; and was

GRAHAME'S ISLAND—GRAIL.

successively curate of Shipton, Gloucestershire, and of Sedgfield, Durham. Ill health compelled him to retire from his duties, and he returned to Scotland, and died near Glasgow.—G. left several poetical works, the chief of which are—*Mary Queen of Scots*, dramatic poem; *The Sabbath*; *The Birds of Scotland*; and *The British Georgics*. It is on *The Sabbath* that his fame rests. He was retiring, amiable, and affectionate, with deep love for nature, and without bold or mounting genius. He has been called the Cowper of Scotland, but is far below Cowper in versification and in idiomatic vigor.

GRAHAME'S (or HO'THAM'S) ISLAND: a mass of dust, sand, and scorix thrown out of a submarine volcano in the Mediterranean, and which remained for some time above the surface of the water. It made its appearance about 30 m. off the coast of Sicily, opposite to Sciacca, 1831, July. In the beginning of Aug., when the action of the volcano had ceased, it had a circumference of about a mile and a quarter, the highest point was estimated at 170 ft. above the sea, and the inner diameter of the crater about 400 yards. As soon as the eruption ceased, the action of the waves began to reduce the island, and in a few months the whole mass disappeared, being scattered as a stratum of volcanic cinder in that portion of the bed of the Mediterranean.

GRAHAM'S LAND: island of the Antarctic Ocean, discovered by Biscoe 1832, Feb.; lat. 64° 45' s., and long. 63° 51' w., nearly on the meridian of the e. extremity of Tierra del Fuego, and not far from the polar circle. The position, as above defined, is precisely that of Mt. William, the highest spot seen. In front, toward the north, are a number of islets, called Biscoe's Range. No living thing appears, except a few birds.

GRAHAM'S TOWN: capital of the e. province of the Cape Colony, s. Africa; near the centre of the maritime division of Albany. It is about 116 m. from Port Elizabeth, with which it is connected by rail, and 25 m. from the sea; 1,760 ft. above sea-level. G. T. is the see of two bishops—one of the Church of England, the other of the Church of Rome, and possesses an English cathedral. It has also 12 churches of various denominations. There are its banks, insurance offices, a botanic garden, a public library, a general hospital, large barracks, and two newspapers. Pop. (1891) 10,498, chiefly English.

GRAIL, n. *grāl*, or **GRADUAL**, n. *grāḍ ū-āl* [mid. L. *grā-ḡā'ē*; It. *graduale*, gradual—from L. *grādus*, a step]: a book of anthems or sentences of Scripture used in the worship of the Rom. Cath. Chh.—so named because originally read from the steps of the 'ambo,' a kind of pulpit.

GRAIL, n. *grāl* [F. *grêle*, slender—from OF. *graile*, fine, small—from It. *gracile*—from L. *gracilis*, slender]: in *OE.*, fine sand; gravel.

GRAIL (THE HOLY), or **GRAAL**, or **GREAL**, or **GRAL**, or **GRAYLE**, n. *grāl* [OF. *graal*, a flat dish; mid. L. *gradālē*.

GRAIN.

a flat dish, a vase (see *SANGREAL*): legendary sacred dish. In the legends and poetry of the middle ages, we find accounts of the Holy Graal—San Gréal—a miraculous chalice, made of a single precious stone, sometimes said to be an emerald, which possessed the power of preserving chastity, prolonging life, and other wonderful properties. The legend was, that this chalice was brought from heaven by angels, and was the one from which Christ drank at the Last Supper. It was preserved by Joseph of Arimathea, and in it were caught the last drops of the blood of Christ as he was taken from the cross. This chalice, thus trebly holy, was guarded by angels, and then by the Templises, a society of knights, chosen for their chastity and devotion, who watched over it in a temple-like castle on the inaccessible mountain Montsalvage. The legend, as it grew, appears to have combined Arabian, Jewish, and Christian elements, and it became the favorite subject of the poets and romancers of the middle ages. The eight centuries of warfare between the Christians and Moors in Spain, and the foundation of the order of Knights Templars, aided in its development. The stories and poems of Arthur and the Round Table were connected with this legend. About 1170, Chrétien of Troyes, and after him other troubadours, sang of the search for the holy G. by the knights of the Round Table, in which they met with many extraordinary adventures. Some have supposed that the story of the connection of the miraculous chalice with the Last Supper and the blood of Christ arose from a wrong division of the words *san gréal*, holy vessel, which were written *sang réal*, royal blood, blood of the Lc rd (royal, though not as some have thought real or true blood); the coincidence is certainly curious, but the inference is very dubious. The legend of the G. was introduced into German poetry in the 13th c., by Wolfram von Eschenbach, who took Guiot's tales of Parci-val and Titurel as the foundation of his poem, but filled it with deep allegorical meanings. Tennyson's *Holy Grail* has recently made the legend familiar to English readers. Much information on the subject may be found in Lang's *Die Sage vom heiligen G.* (1862), Cassel's *Der G. u. sein Name* (1865), Droysen's *Der Tempel des heiligen G.* (1872), and Zarncke's *Der Graltempel* (1876).

GRAIN, n. *grân* [F. *grain*—from L. *granum*; It. *grano*, grain, corn: L. *granûlê*, a little grain]: any small hard mass; a single seed; corn in general; i.e., the seeds of the *Cerealia*; in the United States a common appellation of wheat, often classed in Britain as corn: any minute particle; the smallest weight, so named because supposed of equal weight with a grain of corn (American, wheat); the unit of the English system of weights, there being 5,760 in a Troy lb., and 7,000 in a lb. avoirdupois. (In 1266 parliament declared 32 grains, taken from the best part of the ear and fully dried, to make a pennyweight, 20 pennyweights an ounce): V. to form into grains, as powder. GRAINED, a. *grând*, formed into grains; roughened. GRAIN-DEALER, one who deals in corn. GRAIN-

GRAIN—GRAINING.

TIN, tin melted with charcoal; the tin reduced from the melted grains of tin stone. **GRANARY**, n. *grăn'ă-ră*, a building for storing grain. **GRANIFEROUS**, a. *-ăf'ër-ŭs* [L. *fero*, I carry]: bearing hard seeds or grain. **GRANIFORM**, a. *-ă-fawrm* [L. *forma*, shape]: resembling grains of corn. **GRANIVOROUS**, a. *-ă-rŭs* [L. *voro*, I devour]: grain-eating. **GRANULAR**, a. *grăn'ŭ-lër*, consisting of grains; resembling grains. **GRANULARLY**, ad. *-lĭ*. **GRANULATE**, v. *-lăt*, to form into grains or very small pieces; to make rough on the surface; to repair lost parts, as a wound in healing. **GRANULATING**, imp. **GRANULATED**, pp. **GRANULATION**, n. *-lă'shŭn* [F.—L.]: the act of forming into grains; the art of forming metals into grains by pouring them, when melted, from a height into water; small fleshy excrescences springing up on the surface of wounds in the process of healing. **GRANULE**, n. *-ŭl*, a little grain. **GRANULOSE**, n. *-ŭ-lŭs*, the more soluble portion of the starch grains in plants. **GRANULOUS**, a. *-lŭs*, full of granules.

GRAIN, v. *grăn* [OE. *grain*, the kermes, an insect found on certain oaks, from which the finest red dyes were formerly obtained: F. *graine*, seed, the kermes: It. *grana*, the redness upon the surface of some work: Sp. *grana*, seed, the cochineal dye, the cloth dyed with it]: to paint or ornament in imitation of wood. **GRAIN'ING**, imp.: N. a mode of painting in imitation of the grains of wood; a process of staining. **GRAINED**, pp. *grănd*. **GRAIN'ER**, n. *-ër*, one who paints in imitation of the grain of wood; the brush with which he works; an infusion of pigeon's dung in water, used for giving flexibility to skins in the process of tanning. **GRAIN COLORS**, dyes made from cochineal.

GRAIN, n. *grăn* [Icel. *gren*, a branch: Dan. *green*, a branch, a bough]: direction of the fibres of wood; the wood as modified by the fibres; the form or direction of the constituent particles of a body; the temper or disposition. **GRAINS**, n. plu. *grănz*, an instrument with barbed prongs, used at sea for spearing fish. **AGAINST THE GRAIN**, against the direction of the fibres. **CROSS-GRAINED**, across the natural fibre, and so difficult to plane; ill-tempered. **TO GO AGAINST THE GRAIN**, to be repugnant to; to cause trouble or mortification to. **TO DYE IN GRAIN**, to dye in the raw material; to dye firmly. **THE GRAIN-SIDE OF LEATHER**, that side of the tanned or dressed hide on which the hair grew. *Note.*—The three preceding entries are necessarily connected, but it was judged more convenient to make each one into a separate paragraph, chiefly with the view of exhibiting the derivations with greater distinctness.

GRAIN COAST: see **GUINEA**.

GRAINES D'AVIGNON: see **FRENCH BERRIES**.

GRAINING (*Leuciscus Lancastriensis*): fish of the family *Cyprinidiæ*, of the same genus with the Dace (q. v.), which it much resembles. It was pointed out as a different species first by Pennant, who found it in the Mersey, England. It is rather more slender than the dace. In its habits and food it resembles the trout, rises readily at the artificial fly, and affords good sport to the angler.

Graining (*Leuciscus Lancastriensis*).

GRAINS, n. plu. *gränz* [a corruption of Eng. *drains*. Russ. *dran*, refuse: Dut. *drank*, drees: Sw. *dragg*, grain: (see **DRAINS**)]: the refuse or husks from malt or grain after brewing or distillation; also called **DRAFF**.

GRAINS OF PARADISE, or **MELEGUETTA PEPPER** *měl-ě-gwèt'ta pèp'èr*: aromatic and extremely hot and pungent seed, imported from Guinea. It is the produce of *Amomum Meleguetta*, or *A. Grana Paradisi*, plant of nat. ord. *Scitamineæ* or *Zingiberacæ*, with lanceolate leaves, one-flowered scapes (leafless stems), about 3 ft. high, and ovate or elliptic-oblong capsules containing many seeds. By the natives of Africa, these seeds are used as a spice or condiment to season their food; in Europe, they are employed chiefly as a medicine in veterinary practice, and fraudulently to increase the pungency of fermented and spirituous liquors. By law in England, brewers and dealers in beer are prohibited under heavy penalty from even having grains of paradise in their possession. This drug is much used to give apparent strength to bad gin.—The name Meleguetta pepper, or Guinea pepper (q.v.), is given to other pungent seeds from w. Africa.

GRAIP, n. *grāp* [old Sw. *grepe*, a dung-fork]: in *Scot.*, a dung-fork; a forked instrument for lifting potatoes, etc.

GRAITH, n. *grāth* [Icel. *greithi*, equipment, arrangement; *greitha*, to equip; *greithr*, ready: Ger. *gerāth*, utensils, luggage]: in *Scot.*, furniture; accoutrements; the working tools of a miner; any materials employed by mechanics and others in preparing their work; soapsuds for washing clothes.

GRAKLE, or **GRACKLE**, *grāk'l*: common name of many birds of the starling family (*Sturnidæ*), all tropical or sub-tropical. They have very much the habits of starlings, and some of them even excel starlings in their imitative powers, particularly in the imitation of human speech. This is remarkably the case with the Mina birds (q.v.), of the E. Indies, which may be regarded as grakles. Numerous species inhabit Africa. Some are birds of splendid plumage. The **PARADISE G.** (*Gracula gryllivora*) of India has acquired a peculiar celebrity as a destroyer of locusts and caterpillars. It is about the size of a blackbird. Buffon tells us, that in order to stop the devastations of locusts in

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the island of Bourbon, this bird was introduced from India by the government. The grakles, however, beginning to examine the newly-sown fields, excited the alarm of the planters, and were exterminated; but it was found necessary, after a few years, again to introduce them, and they are now very numerous, though they do not confine themselves to insect food, but in default of it eat seeds and fruits. They sometimes enter pigeon-houses and feed on the eggs, or even on the newly hatched young. When tamed, they become very pert and familiar, and exhibit a great aptitude for imitating the voices of animals. A G. of this species, kept in a farmyard, has been known to imitate most of its ordinary sounds, as those of dogs, sheep, pigs, and poultry.—Some of the grakles are known as summer birds of passage in the northern parts of America.

GRALLÆ, n. plu. *grāl'lē*, also GRALLATORES, n. plu. *grāl'li-tō'rēz* [L. *grallator*, he that goes on stilts; *grallæ*, stilts—from *grādus*, a step]: stilted or long-legged wading birds, such as the stork or crane. GRAL'LATORY, a. -*tēr-ī*, of or pertaining to; also GRAL'LATORIAL, a. -*tō'rī-āl*.—The *Grallatores* are an order of birds, generally characterized by very long legs, the *tarsus* (shank) in particular being much elongated, and by the nakedness of the lower part of the tibia, adapting them for wading in water without wetting their feathers. They have also generally long necks and long bills. The form of the bill, however, is various: and in its size, strength, and hardness, it is adapted to the variety of food; some, as snipes, which feed chiefly on worms and other soft animals, having a very soft weak bill, while others, which feed on larger and stronger animals, have the bill proportionately large and strong. The form of the body is generally slender. The greater number of the G. are inhabitants of the sea-coast or of marshy districts. Many are birds of passage. Even those which are not aquatic are generally driven from the districts which they frequent either by frost or drought. Cuvier divided this order into *Brevipennes* (q.v.), Ostrich, Cassowary, Emu, etc.); *Pressirostres* (Bustards, Plovers, Lapwings, etc.); *Cultrirostres* (Cranes, Herons, Storks, Adjutants, Spoon-bills, etc.); *Longirostres* (Snipes, Curlews, Godwits, Sandpipers, etc.); and *Macroductyli* (Rails, Crakes, Coots, etc.). The *Brevipennes* are constituted by some into a distinct order, *Cursores*, and differ very widely in many respects from the true Grallæ.

GRAM, n. *grām* [Icel. *gramr*, wrath]: in *OE.*, angry; wrathful.

GRAM, n. *grām*: name by which the chick-pea is known in the East, used as food when roasted: see CHICK-PEA.

GRAM, or GRAMME [see GRAMME]: standard unit of French measures of weight; the weight of a cubic centimètre of distilled water at 0° centigrade (corresponding to 32° Fah.): the other weights have received names corresponding to the number of grammes that they contain, or the number of times that they are contained in a gramme: in the former case, the Greek numerals deca, hecto, kilo, my

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ria, expressing weights of 10 grammes, 100 grammes, 1,000 grammes, 10,000 grammes; in the latter case, the Roman numerals *deci*, *centi*, are prefixed, to express tenths, hundredths of a gramme. Starting from the relation between the English yard and the French *mètre*, we are enabled to compare the units of weight, and it is found that a gramme = 15·432348 grains Troy, from which the equivalents in English measure for the other weights can easily be found: thus—

	Grains Troy.	Lbs. Avoirdupois.	
Centigramme =	·1543234 =	·000220462	
Decigramme =	1·543234 =	·00220462	
GRAMME =	15·43234 =	·0220462	
Decagramme =	154·3234 =	·220462	
Hectogramme =	1543·234 =	2·20462	
Kilogramme =	15432·34 =	22·0462	
Myriagramme =	154323·4 =	220·462	= 1·9684 cwt.
Quintal (q.v.) =	1543234 =	2204·62 =	1·9684 "

GRAMERCY, *n.* *gră-mér'si* [*F. grand*, great; *merci*, thanks]: in *OE.*, great thanks, an expression of thanks for an obligation.

GRAMINEAL, *a.* *gră-mîn'ě-ăl*, or **GRAMIN'EOUS**, *a.* *-ě-ūs*, and **GRAM'INACEOUS**, *a.* *-ă'shūs* [*L. graminěūs*, pertaining to grass—from *grăměn*, grass: *F. graminee*]: grassy; like grass; pertaining to grass. **GRAMINEÆ**, *n. plu.* *gră-mîn'ě-ě*, or **GRAMINACEÆ**, *grăm'in-ă'si-ě*, a very extensive and important order of plants called grasses (see **GRASSES**). **GRAMIN'IFO'LIUS**, *a.* *-i-fō'li-ūs* [*L. foliūm*, a leaf]: bearing leaves like grass. **GRAM'INIV'OROUS**, *a.* *-ăv'ō-rus* [*L. voro*, I devour]: feeding on grass.

GRAMMAR, *n.* *grăm'mér* [*F. grammair*e—from mid. *L. grammāriā*—from *Gr. gramma*, a letter]: the science which treats of the principles of language; the art of speaking, reading, or writing any language with correctness according to established usage, the book containing the rules and principles relating to a language; propriety of speech; speech according to grammar: **ADJ.** pertaining to. **GRAMMA'RIAN**, *n.* *-mă'ri-ăn*, one versed or skilled in the grammar of a language. **GRAMMAT'ICAL**, *a.* *-măt'i-kăl*, or **GRAMMAT'IC**, *a.* *-ik* [*L. grammaticus*—from *Gr. grammat'ikōs*]: according to the rules of grammar; belonging to grammar. **GRAMMAT'ICALLY**, *ad.* *-li*. **GRAMMAT'ICALNESS**, *n.* the quality of being according to the rules of grammar. **GRAMMAT'ICIZE**, *v.* *-siz*, to render grammatical; to act the grammarian. **GRAMMAT'ICIZING**, *imp.* **GRAMMAT'ICIZED**, *pp.* *-sizd*.

GRAM'MAR, in its usual sense, and as applied to a particular language: investigation and systematizing of the facts of a language, as exhibited in the most approved writers and speakers; the main divisions or heads being: (1) the way in which the sounds or spoken words are represented by letters (Orthography); (2) the division of words into classes, or 'parts of speech,' the changes or inflections that they undergo, their derivation and composition (Etymology); (3) the way in which they are joined together to form sentences (Syntax). A book embodying the results of such investigations, with a view to enable learners to

GRAMMAR SCHOOL.

understand a language, and to use it properly, is a G. of that language.

Languages were not originally constructed according to rules of G. previously laid down; but G. rules were deduced from languages already in existence. In the days of Plato, perhaps the greatest master of language that ever wrote, the division of words into classes or parts of speech had not yet been made. Plato himself, according to Max Müller, took the first step in formal G. by making the distinction of noun and verb, or rather of subject and predicate; for it was a distinction in the ideas or elements of a proposition which he was making, rather than in the words themselves. Aristotle and the Stoic philosophers made further advances in the analysis of language, but they attended little to the forms of words, their object being logical rather than grammatical (see GENITIVE). It was the Alexandrian scholars, engaged in preparing critical editions of Homer and the other Greek classics, who first analyzed, classified, and named the phenomena of language as language; and it was one Dionysius Thrax, who had been trained in the Alexandrian school and became a teacher of Greek (*Grammaticus*, from Gr. *gramma*, a letter; as those who taught boys their Roman letters were called *Literatores*) at Rome, that published the first practical systematic Greek G. for the use of his Roman pupils (about B.C. 80). This work, which still exists, though much interpolated, became the basis of all subsequent grammars, both Greek and Latin; and when grammars of the modern European tongues came to be written, they naturally followed the classical models. For the chief matters treated of in G., see such heads as ADJECTIVE: CONJUNCTION: DECLENSION: ETC.

In quite recent times, the study of language has advanced beyond this empirical stage, in which its object was confined to the explaining and teaching individual languages; and, under the name of 'Comparative Grammar,' has brought to light the resemblances and differences of the various languages of the world, so as to classify them, after the manner of natural history, into families and minor groups, according to their greater or less affinities. Still higher questions, entering into the origin and growth of speech, and seeking to give a scientific account of its phenomena, now occupy the more advanced students of this subject. See LANGUAGE: INFLECTION.

GRAMMAR SCHOOL: originally a school giving prominence to Latin and Greek study. Such schools received their name at a time when the grammar of the English language was not written, and when all knowledge of the principles of language could be obtained only through a study of the grammar of the ancient tongues, particularly Latin. In Britain this idea at the basis of these institutions still pervades them, and the ancient languages are principal subjects of instruction. History, geography, science, and modern languages have of late years been admitted into the curriculum of the great majority of these schools; but these subjects still hold a subordinate place,

GRAMME—GRAMMONTIANS.

and distinction in Latin and Greek gives pre-eminence, and is the great object of ambition both to masters and to pupils. Nor can it be otherwise so long as the universities recognize the ancient tongues as the only sound basis of a liberal education. See further, EDUCATION: EDUCATION, NATIONAL OR STATE: SCHOOLS, PUBLIC AND GRAMMAR.

GRAMME, or GRAM, n. *grām* [F.—from Gr. *gramma*, what is written]: French unit of weight equal to 15·432 English grains: see GRAM.

GRAMMONT, *grām-mōng'* (Belgian, *Geeraerdsbergen*): small town of Belgium, province of E. Flanders, on both banks of the Dender, 20 m. s.s.e. of Ghent. It has manufactures of lace, fine linen, damask and woolen fabrics, and tobacco; and carries on cotton-spinning, dyeing, bleaching, tanning, distilling, and brewing. Pop. (1880) about 9,000.

GRAMMONT' (or GRAMONT), PHILLIBERT, Count of: French courtier: 1621–1707; son of Anthony, Duke of G. While still very young, he served as a volunteer under Condé and Turenne, and distinguished himself by chivalric bravery. At the court of Louis XIV., with this reputation added to his youth, noble birth, a handsome person, fine talents and accomplishments, a lively wit, and strangely good-fortune at gaming, at which he won such amounts as to support even his extravagant expenditures, he easily became a favorite. He was distinguished for his gallantries, and even had the audacity to aspire to be the rival of the king in the affections of one of his favorites. This caused him to be banished from France; and he found a pleasant refuge and congenial society in the gay and licentious court of Charles II. of England. Here, after many adventures, he engaged to marry Eliza Hamilton, sister of Anthony, Count Hamilton, but slipped out of London without fulfilling his promise. Two of the lady's brothers set off in pursuit of the forgetful Frenchman, and coming up with him at Dover, asked him 'if he had not forgotten something.' 'O, to be sure,' replied G, 'I have forgotten to marry your sister,' and returned to London to complete his engagement. He then went to France, where his wife became one of the ladies of the court of Maria Theresa of Austria. By this marriage he had two daughters, one of whom was married to Henry Howard, Marquis of Stratford, and the other became Abbess of Poussay, in Lorraine. See *Memoirs of the Comte de Grammont* by his brother-in-law, Anthony, Count Hamilton (edited by Sir Walter Scott 1811; reprinted in Bohn's 'extra volumes'). These memoirs, not to be commended for general reading, show the frightful profligacy of the court of Charles II. which followed and explain the stern moral reaction of Puritanism.

GRAMMONTIANS, n. *grām-mōn'tī-anz* [from *Grandmont*, whither the order moved after Stephen's death]: in *chh. hist.*, monastic order founded at Muret 1073, with the sanction of Pope Gregory VII., by Stephen of Thiers, nobleman of Auvergne, who is sometimes called Stephen de Muret,

GRAMOPHONE.

GRAMOPHONE, *grām'ō-fōn* [Gr. *gramma*, a writing; *phonē*, voice]: instrument for producing the same effects produced by the Phonograph (q.v.). It was invented 1890 by Emil Berliner. At an exhibition of the G. by its inventor before the Amer. Institute of Electrical Engineers, New York, 1890, Dec. 16, the instrument uttered through its mouthpiece, in tones loud enough to be heard plainly in every part of a large room, songs, piano music, cornet solos, clarinet solos, band music, and organ music. The degrees of clearness varied; and while the G. never reproduced the original sounds with absolute fidelity, it approached perfection very nearly. Instead of a cylinder, as in Edison's phonograph, the G. has a zinc disk for receiving the impressions; the disk is covered with a film of wax, through which the recording stylus cuts down to the zinc surface. The lines traced by the stylus are afterward eaten out in the zinc by an acid. The disk is mounted on a vertical spindle, within an etching-trough, which revolves with it. The mouth-tube, diaphragm, and recording stylus are mounted on a carriage moved toward the centre of the disk by a screw taking its motion from the spindle. The disk is revolved rapidly by a wheel, which is turned by a hand-crank. As the disk revolves, sounds that enter the mouthpiece are transmitted to the diaphragm. The vibrations of the diaphragm are imparted to the stylus, and, as the disk revolves, the stylus records in the wax wavy lines that represent the sounds entering the mouthpiece. As the carriage bearing the stylus is slowly moved toward the centre of the disk, the impressions on the wax form a spiral line. When the record is finished, the disk is flooded with the acid. The record being thus completed, a separate machine is used for reproducing the sounds. To the reproducing machine the disk is transferred after all the wax has been removed from its surface. As in the recording instrument, the disk is mounted on a spindle, with which it revolves. The diaphragm carries a stylus, which follows the spiral groove in the disk, and produces in the diaphragm vibrations that correspond to those which the diaphragm of the recording machine received. A great trumpet, at the smaller end of which the diaphragm and reproducing stylus are carried, sends out a remarkable volume of sound. Copies *ad libitum* can be made from the disk.

GRAMPIANS—GRAMPUS.

GRAMPIANS; mountains in Australia, running n. and s. in w. Victoria, in s. lat. $36^{\circ} 52' - 37^{\circ} 38'$ and in e. long. $142^{\circ} 25' - 142^{\circ} 47'$. From their e. slope flow the Glenelg and its affluents. The loftiest peak of the range, Mt. William, is 4,500 ft. above the sea.

GRAMPIANS, *grām'pī-anz*: principal mountain system in Scotland; running from n.e. to s.w., forming the well-known high grounds of Aberdeenshire, Kincardineshire, Forfarshire and Perthshire. The average elevation of the summits of this main range is from 2,000 to 3,000 ft., and the highest elevation reached is that of Ben Nevis (4,406 ft.) at its w. extremity. An outlying branch of the G. extends northward from near the head of the valley of the Dee, and comprises among its chief summits Ben Muicdhuì (4,296 ft.) and Cairngorm (4,084 ft.). Southward of the w. extremity of the G. are numerous groups and chains of greater or less extent. Among these the chief summits are Ben Cruachan (3,693 ft.), Ben Lomond (3,192 ft.), Ben More (3,845 ft.), Ben Lawers (3,984 ft., with cairn 4,000), and Schiehallion (3,547 feet).

GRAMPUS, n. *grām'pus* [probable corruption of F. *grand poisson*, It. *gran pesce*, or Sp. *gran pez*; L. *grandis piscis*, great fish]: large species of arctic dolphin; a cetaceous animal, common in the arctic seas, as on the coasts of Greenland and Spitzbergen, not unfrequent in the Atlantic. It is one of the *Delphinidae*, or dolphin family, and is commonly referred by naturalists to the same genus with the porpoise, under the names *Phocæna Orca*, *P. Grampus* and *P. gladi-*



Grampus (*Phocæna Orca*).

ator, although a new genus, *Grampus*, also has been proposed for it. It is the largest of the *Delphinidae*, often more than 20 ft. in length; its form spindle-shaped, but thicker in proportion than the porpoise, from which it differs also in the much greater height of its dorsal fin, in the upper jaw projecting a little over the lower, and in the smaller number of teeth, which are about 11 on each side

GRAN—GRANADA.

in each jaw. The tail is powerful; in a specimen 21 ft long, the tail was 7 ft. broad. The G. is generally seen in small herds. It is very voracious, and pursues salmon up the mouths of rivers as far as the tide reaches. Marvellous stories are told of attacks which it makes on the whale, and of its tearing and devouring the whale's tongue; these stories need confirmation. The G. possesses great strength and activity.

GRAN: county of n.w. Hungary, intersected by the rivers Danube and Gran; 424 sq. m. It is fertile, producing grain, fruits, and wine; and abounds in marbles, limestone, and coal. Chief town, Gran. Pop. about 65,400, mostly Magyars.

GRAN, *grán* (Mag. *Esztergam*): town of Hungary, finely situated on an elevation on the right bank of the Danube, 25 m. n.w. of Pesth. It is a royal free town, is the see of the primate of Hungary, has a large cathedral, after the model of St. Peters at Rome; one of the finest churches in Hungary. The town is rich in fine buildings. Pop. (1890) 9,349. G., which is one of the oldest towns of Hungary, was the residence of the Hungarian prince Gejza; and here his son, St. Stephen, first king of Hungary, was born 979, and converted to Christianity 1000. It was formerly fortified, and has undergone assaults and sieges almost without number.

GRANADA, *grá-ná'da*, Sp. *grá-ná'thá*: ancient kingdom, one of the old provinces in s. Spain. It was bounded w. by Andalusia, e. by Murcia, and s. and s.e. by the Mediterranean. Its greatest length from n.e. to s.w. was about 210 m., greatest breadth about 80 m. It is now divided into the three modern provinces of Granada, Almeria, and Malaga, united areas 11,063 sq. m.: united pop. (1900) 1,363,462. The surface of this ancient province is mountainous and highly picturesque. The mountain-ranges—the chief of which are the Sierra Nevada, the Sierra de Ronda, and the Alpujarras—generally run parallel with the coast. The principal rivers are the Almanzora, Almeria, Jenil, Guadalhorce, and Guadiaro, all of which—except the Jenil, an affluent of the Guadalquivir—flow into the Mediterranean. The province of G. is, on the whole, fruitful and highly cultivated. The mountains are rich in silver, copper, lead, and iron; and many of the inhabitants are engaged in mining and smelting. Saline and mineral springs abound. In the time of the Romans, G. was a portion of the province of Baetica; but after the Arab invasion it formed an independent Moorish kingdom. For a time it was exceedingly wealthy. From 1248 the Moorish kings of G. were forced to recognize the supremacy of the kings of Castile. A quarrel, however, which arose between the vassal king of G. and Ferdinand and Isabella in the 15th c., resulted in the war of 11 years, the consequence of which was the complete conquest of G. by the Spaniards 1492, and the total destruction of Moorish authority in Spain. The modern province of G. has 4,920 sq. m. Pop. (1900) 492,460.

GRANADA.

GRANA'DA (Spanish, *Granata*, Arab, *Garnathah*, said to be a corruption of *Karnáttah*, the ancient fortress of Phœnician origin): famous city of Spain, formerly cap. of the kingdom of G., and now chief town of the modern province of G. It is built on a northern branch of the Sierra Nevada, 2,445 ft. above sea-level, lat. 37° 15' n., long. 3° 45' w.; about 140 m. e.s.e. of Seville. It stands on the right bank of the Jenil, overlooking the fertile and extensive *Vega* or plain of G., and is watered also by the Darro, a rapid mountain-stream, which joins the Jenil about a mile below the town. Though now sadly decayed, it is still one of the greatest towns of Spain, is the seat of an archbishop, and has a university, attended, it is said, by about 800 students. One of the two hills on which the town mainly is built is surmounted by the Alhambra (q.v.); the other hill is occupied by the suburb called the Albayzin, the oldest part of the town, and now inhabited almost entirely by gypsies. The city of G. proper, namely, that portion that contains the Alhambra, is surrounded by high but ruinous walls, and by strong towers. The streets are narrow, crooked, and uneven; the houses, mostly well built, are heavy and gloomy in outward appearance, having the flat roofs and projecting balconies of Moorish architecture; the interiors, however, are convenient and suitable to the climate. G. has several charming public squares. The cathedral, a splendid structure, profusely decorated with jaspers and colored marbles, and having a high altar under a dome supported by 22 pillars, contains the monuments of Ferdinand and Isabella, and of Philip I. and his consort Juana. The industry and trade of the town are inconsiderable. Pop. (1900) 75,900.

The modern city of G. was founded by the Moors in the 8th c.; and for some time remained subject to the caliphs of Cordova; but 1235 it became cap. of the kingdom of Granada, and rapidly rose to distinction as a wealthy trading city and as the seat of arts and architecture. Under the Moors, it attained its highest prosperity. Toward the close of the 15th c., it is said to have had 40,000 inhabitants, and to have been surrounded by a wall fortified with 1,030 towers. The *Vega* of G., in front of the city, was celebrated for two hundred years as the scene of the contest between the Moors and the chivalry of Christendom—a contest ended only by the capture and complete subjection of G., the last Moorish stronghold in Spain, by Ferdinand and Isabella 1492, after a siege of 12 months.

GRANADA, *grá-ná'dá*: province of Nicaragua, between lakes Nicaragua and Managua bounded w. by the Pacific Ocean; 2,943 sq. m. A low range of mountains extends through the central portion, and in then. and w. parts are Mombacho, Masaya, Madera, and Ometepe volcanoes. The province contains a large stretch of cultivated and thickly populated table-land, numerous mineral springs, a considerable quantity of precious minerals, several small lakes (see also lake NICARAGUA) and a few shallow, non-navigable rivers. Pop. 56,000.

GRANADA: city of Nicaragua in the dept. of G.; on

GRANADILLA—GRANBY.

the n.w. side of Lake Nicaragua. It was founded by Hernandez de Cordova 1522. Prior to 1854, it was the thriving seat of many commercial establishments. It suffered greatly, however, from the civil war that broke out in the republic during that year, and was under siege 1854, May—1855, Feb.; but was bravely and successfully defended by Don Fruto Chamorro, leader of the conservative party. In 1856, Chamorro having in the meantime died, G. was surprised and taken by the democrats, but was retaken and almost wholly destroyed in the following year. After peace, efforts were made toward the restoration of the city. It has not yet, however, regained its former prosperity and importance. Pop., including the suburbs and the municipality of Jalatava (1895) 25,000.

GRANADILLA, *grăn-a-dil'la*: edible fruit of certain species of Passion-flower (q.v.). The name, originally bestowed by Spanish settlers in the W. Indies and warm parts of America, is a diminutive of *granada*, a pomegranate. The COMMON G. (*Passiflora quadrangularis*) is extensively diffused over these regions, and much cultivated. The plant is a luxuriant and very ornamental climber, often employed to form arbors and covered walks; it has large, beautiful, and fragrant flowers; oblong fruit, often six inches in diameter, of agreeable fragrance, and a sweet and slightly acid pulp, very gratefully cooling. It is often eaten with wine and sugar.—The APPLE FRUITED G., or SWEET CALABASH (*P. multiformis*), is plentiful in the woods of Jamaica, where it forms a principal part of the food of wild swine. It is a very agreeable fruit, about two inches in diameter, its pulp gelatinous, the rind so hard as to be sometimes made into snuff-boxes and toys. The LAUREL-LEAVED G. (*P. laurifolia*), sometimes called water-lemon in the W. Indies, is a fruit about the size of a hen's egg; the plant has red and violet fragrant flowers, and very long tendrils. The fruit has a whitish pulp, so watery, that it is usually sucked through a hole in the rind; it has a delicious flavor, and a slight acidity. It is much cultivated.—Several kinds of G. are occasionally cultivated in hothouses in more northern countries. In s. Europe, they grow in the open air.

GRANARY, GRANULA, GRANULATE, etc.: see GRAIN 1.

GRAN'ARY WEE'VIL: another name of the CORN WEEVIL (q.v.).

GRANBY, *grăn'bî*, JOHN MANNERS, Marquis of: English general: 1721, Jan. 2—1770, Oct. 20; eldest son of the third Duke of Rutland. Educated at Eton and Cambridge, he was at an early age elected M.P. for Grantham. In the rebellion of 1745, he raised a regiment of infantry, and accompanied the Duke of Cumberland into Scotland. Appointed col. of the horse guards 1755, in 1759, Feb., he received the rank of lieut.gen., and soon was sent to Germany as second in command, under Lord George Sackville, of the British troops, co-operating with the king of

GRAND—GRAND ARMY OF THE REPUBLIC.

Prussia. After the battle of Minden, for his conduct in which he received the thanks of Prince Ferdinand of Brunswick, to the disparagement of his superior officer, who resigned, and was afterward cashiered, he was appointed commander-in-chief of the British troops, and held that post during the remainder of the seven years' war. He particularly distinguished himself at the battles of Warburg 1760, of Kirchdenkern 1761, and of Græbenstein and Homburg 1762. In 1760, during his absence with the army, he was appointed a member of the privy council. After the peace of 1763, he was constituted master-gen. of the ordnance, and 1766 commander-in-chief of the army. Though very popular in his time, as evidenced by the frequency with which his portrait was used as a sign to public houses, he was the subject of some of the most terrible invectives of Junius; and his military qualities appear to have been much overrated by his contemporaries.

GRAND, a. *gränd* [F. *grand*; It. *grande*—from L. *grandis*, great, large]: splendid; sublime; lofty; great, as applied to size; the second degree of parentage or descent, as *grandmother*; principal or chief, as *grand-master*; in *music*, synonymous with great—e.g., grand sonata, grand symphony, signifying that the composition is full, not simple or easy. GRANDLY, ad. *-li*. GRAND CAPE, in *English law*, the name of the writ whereby in an action of dower, on the failure of the defendant to appear to answer to the summons, a third part of his lands are attached to await the decision of the court. GRAND JURY, a jury of the good and true men of the county who decide whether there is sufficient evidence to put any persons accused on trial (see below). GRANDCHILD, n. a son or daughter's child, the male being a *grandson*, the female a *granddaughter*. GRANDFATHER, or GRANDSIRE, n. the father of one's father or mother. GRANDMOTHER, n. the mother of one's father or mother. GRANDEE, n. *grän-dē'* [Sp.]: a Spanish nobleman; a man of great rank (see below). GRANDEE-SHIP, n. the state or rank of a grandee. GRAND'NESS, n. magnificence; greatness. GRAND'EUR, n. *-yēr* [F. *greatness*]: splendor of appearance; that which excites a feeling or sentiment of greatness; elevation of sentiment, language, or mien.—SYN. of 'grand': noble; imposing; majestic; stately; splendid; magnificent; superb; august; dignified. elevated; pompous; exalted; extensive; chief; principal; eminent; superior.

GRAND ALLIANCE: compact between Emperor Leopold I. of Germany, and Holland, to which England, Spain, and Saxony were subsequently admitted, agreed to at Vienna, 1689, May 12, for the purpose of preventing the union of France and Spain as a single monarchy.

GRANDAM, n. *grän'dām* [Eng. *grand*, and *dam*]: a grandmother; an old withered woman.

GRAND ARMY OF THE REPUBLIC: national organization of the survivors of the Union army and navy of the war against secession. The first post, as the local subordinate bodies are called, was organized in Decatur, Ill.,

GRAND COUTUMIER OF NORMANDY.

1866, Apr. 6; the first national convention of veterans was held in Indianapolis, 1866, Nov. 20; and the national encampment, or supreme body, was formed in Philadelphia 1868, Jan. 15. The constitution of the G. A. R. in its present form provides that 'soldiers and sailors of the U. S. army and navy, and marine corps, between Apr. 12, 1861, and Apr. 9, 1865, in the war for the suppression of the rebellion, and those having honorable discharge therefrom for such service, and of such state regiments as were called into active service and subject to the orders of U. S. general officers between the dates mentioned, shall be eligible to membership in the Grand Army of the Republic. No person shall be eligible who has at any time borne arms against the United States.' The organization is designed to be patriotic, benevolent, and non-political in character. Between 1871-86 \$1,173,688 were raised and expended for charitable purposes. In 1902, June 30, the total membership was reported at 263,745, and the Grand Army posts numbered, 6,416. The G. A. R. makes a special business of observing Decoration Day and looking after the pension interests of its members.

GRAND BANK, in the Atlantic Ocean: part of the submarine 'Telegraphic Plateau,' lying e. of Newfoundland, about 600 m. long, 200 m. wide, and 30 to 60 fathoms below sea-level. On this plateau lie the British and French submarine cables. It is supposed to have been formed by the precipitation of gravel, earth, and stone brought from Greenland by icebergs and released from the ice by the action of the warm water of the Gulf Stream. The G. B. is one of the most noted cod-fishing regions of the world, and by international treaties fishermen of the United States, England, France, and Canada have equal privileges there.

GRAND-COMBE, LA., *lã grông-kông*: town of France, dept. of Gard, 35 m. n.w. of Nîmes. Near it are some very important collieries. In the town are oil-mills and glass-works. Pop. 7,000.

GRAND COUTUMIER OF NORMANDY, *grông kô-tũ-mê-ũ'*: collection of the ancient laws of Normandy, said to have been compiled in the third year of Henry III. It contains the laws and customs in use in England during the reigns of Henry II., Richard I., and John; also those in force in Normandy after the separation of that duchy from England. It is therefore a collection of the laws of Normandy as they stood subsequent to the union with England. The customs of Normandy were to a great extent adopted in England after the Conquest; and the laws of England particularly during the reigns of the Norman sovereigns, present great similarity to those of Normandy. Sir Matthew Hale, jealous for the honor of England, contends that this similarity arose from the introduction of English customs into Normandy. In the rules of descent, of writs, of process, and of trial, the laws of England and Normandy were at first almost identical. It appears from the G. C., that though the verdict of 12 men was always

GRAND DAYS.

required on a trial by jury, yet in case of difference of opinion among the original jurors, the minority were set aside and fresh jurors chosen, until 12 men could be found to agree in a verdict. By the custom of Normandy, where a married woman dies possessed of land, her husband was entitled to hold the lands, but only while he remained a widower. By the courtesy of England, on the other hand, the widower held the lands for his life. Lands held by knights' service (q.v.) and grand serjeanty (q.v.) descended, according to Norman custom, to the eldest son; but lands held on an inferior tenure were divided among the sons. Also where a man had cohabited before marriage with the woman who afterward became his wife, a son born before marriage inherited the land to the exclusion of children born in wedlock. See Hale's *History of the Common Law*. The islands of Guernsey, Jersey, Alderney, and Sark were originally part of the duchy of Normandy, and were united to the crown of England by the first princes of the Norman line. Though still attached to England, they are governed by the old feudal laws, or coutumier of Normandy. They have their own independent courts; and a writ from the courts at Westminster does not run in these islands. A royal commission under the great seal of course has force, but the commissioners must judge according to the law of the islands. All causes are originally determined by their own officers, the bailiffs and jurats of the island, who administer a code of laws based upon the G. O. From their decision an appeal lies to the privy council. Acts of the British parliament are not in force in these islands unless the islands are specially named.

GRAND DAYS, in English Law: formerly those days in every term solemnly kept in the Inns of Court and Chancery—viz. in Easter term, Ascension-day; in Trinity term, St. John the Baptist's Day; in Michaelmas term, All Saints' Day (and of late, All Souls' day); and in Hilary term, the festival of the Purification of our Lady, commonly called Candlemas day; and these are *dies non iudicii*, no days in court.—*Cowel*. On these days were formerly held the revels for which the Inns of Court were famous. The last revel held in the Inner Temple was on Candlemas day 1733, on the occasion of Mr. Talbot's elevation to the woolsack. At this feast, 14 students of the Inn waited at the benchers' table. After dinner a play was performed by actors, who came full dressed from the Haymarket in chairs, and it is said, refused to receive payment for the honor of the occasion. After dinner, judges, sergeants, and benchers, formed a ring round the stove in the centre of the hall, and danced, or rather walked about the coal fire, according to the old ceremony, three times, and all the time the ancient song was sung by one Toby Aston, dressed in a bar-gown. The Prince of Wales, Frederick, father of George III., witnessed this part of the ceremony *incog*. The room was then prepared for dancing, which was kept up, with the pleasing interlude of a splendid supper, until morning. See Pearce's *Inns of Court and*

GRANDEE—GRANDEES.

Chancery.—G. D. continue to be observed, but they have no longer a solemn or formal character. Nor are they held on the same days as formerly; for by the alteration in the law terms those days no longer fall within the term. G. D. are now fixed at the pleasure of the benchers. On these days an entertainment is given in hall to the judges who had formerly been members of the Inn, and on this occasion an additional bottle of wine is supplied to every mess of four men among the barristers and students. On circuits, also, the circuit bar appoints a special day for the grand day, on which, after dinner, the various matters of social interest affecting the circuit are discussed and settled.

GRANDEE, GRANDEUR: see under GRAND.

GRANDEES' [Span. *grandes*]: the most highly privileged class of the nobility of the kingdom of Castile: the term has been in use since the 13th c. To this class belonged the whole of that very powerful portion of the nobility who, from their wealth, were called the *Ricos Hombres* by pre-eminence; and to whom, moreover, the crown had granted the right of bearing a banner, and of gathering mercenaries around it on their own account. The members of the royal family were as such included among the G. The honors were hereditary; the G. held lands from the crown on the tenure of military service, being bound to produce a certain number of lances, each lance being represented by a knight with four or five men-at-arms. The G. were exempted from taxation, and could not be summoned before any civil or criminal judge without a special warrant from the king. They were entitled to leave the kingdom, and even to enter the service of a foreign prince at war with Castile without incurring the penalties of treason. Besides these privileges, common to them with the rest of the higher nobility, the G. had several peculiar to themselves, or shared only with the so-called 'Titulados'—the counts and dukes. Of these was the right in all public transactions to remain covered in the presence of the king. The king addressed a grandee as *mi primo*, 'my cousin-german;' whereas any other member of the higher nobility he called only *mi pariente*, 'my relative.' In the national assemblies, the G. sat immediately after the prelates and before the titled nobility (titulados). They had free entrance into the palace, and into the private chambers of the monarch; and on the occasion of religious solemnities, they had their place in the chapel-royal next to the altar. Their wives shared their dignities, the queen rising from her seat to greet them. Under Ferdinand and Isabella, Cardinal Ximenes succeeded in breaking the power of the feudal nobility so completely, that by the end of the 15th c. the privileges both of the G. and of the rest of the higher nobility were almost abolished. Ferdinand's successor, Charles V., who considered it still necessary to bind to his party some of the nobles, and to reward others for the important services which they had rendered him, contrived out of an

GRAND FORKS—GRAND JURY.

independent to construct a dependent court nobility.

GRAND FORKS: city, cap. of Grand Forks co., N. D.; at the head of navigation on the Red river of the north; on the St. Paul Minneapolis and Manitoba and the Duluth and Manitoba railroads. It is in the rich farming region of the Red River valley; is substantially built with brick of local manufacture; has gas and electric light plants, improved water-works system, and good sewerage; and contains co. court-house and jail (cost \$150,000), 5 grain elevators (capacity 450,000 bushels), 8 churches, U. S. land office, Univ. of N. D., high school, grammar schools, 18 hotels, 2 daily and 2 weekly newspapers, 2 breweries, and 2 national banks (cap. \$200,000). Pop. (1885) 4,692; (1890) 4,979; (1900) 7,652.

GRAND HA'VEN: thriving city, seat of justice of Ottawa co., Mich. on the e. shore of Lake Michigan, at the mouth of Grand river, 112 m. n.e. of Chicago. It is the w. terminus of the Detroit and Milwaukee railroad, which has here an extensive depôt and a pier 3,000 ft. long extending into the lake. G. H. has a spacious and excellent harbor, with a depth of 30 to 50 ft. It has a magnetic spring of some repute for curative properties. There are exports of timber, fish, leather, gypsum, stucco lime, and flour: exports have already, in some years, exceeded one million dollars in value, and the trade is increasing. Pop. (1880) 4,862; (1890) 5,023; (1900) 4,743.

GRANDILOQUENT, a. *grăn-dîl'ô-kwënt* [L. *grandis*, great; *loquentem*, speaking—from *loquor*, I speak]: pompous in language: bombastic. **GRANDILOQUENCE**, n. *-kwëns*, pomposity of language. **GRANDILOQUENTLY**, ad. *-lî*.

GRAND ISLAND: a city and cap. of Hall co., Neb., on the Platte river and several railroads; 154 m. w. of Omaha. It is the seat of the Nebraska Soldiers' and Sailors' Home; has a national bank, railroad, machine, and car shops, meat packing houses, beet sugar factories, etc. Pop. (1890) 7,536; (1900) 7,554.

GRAND JURY, or **GRAND INQUEST**: assembly of good and sufficient men, summoned by a sheriff to attend at sessions of courts, for the purpose of inquiring into the charges for offenses and determining whether persons accused of crime shall be indicted and tried therefor, and for inquiring into other matters assigned to them by the court or within their knowledge—returning to the court their delivery thereon.—The institution of the G. J. dates back to the earliest period of English history, having been in use among the Saxons. (Wilkins, *Leges Ang. Sax.* 117.) It appears that the number of the G. J. was originally 12, but we learn from Bracton that, in the time of Henry III., it was the practice to return four knights for every hundred, who elected 12 other knights, or else 12 *liberos et legules homines*, to take part with them in the inquest. This jury was called *le graunde inquest*, and made inquiry for the county, while the jury for the hundred inquired for its own district only. After the establishment of the *graunde inquest*, the practice of summoning a jury of the

GRAND JURY.

hundred gradually went out of use; but until 6 Geo. IV. c. 50, it was deemed necessary that some of the G. J. should be summoned for every hundred. In the present day, in England, and in the United States, the G. J. must consist of not less than 12, and usually not more than 23 members. The number varies in different states. The qualification of grand jurors is the same as that of the petit jury. See JURY TRIAL. The court may select the foreman or allow the jury to select. The foreman, and then each member of the G. J. takes the following oath: 'You do swear (or affirm) that you will diligently inquire, and true presentment make, of all such matters and things as shall be given you in charge, or otherwise come to your knowledge, touching the present service; the commonwealth's counsel, your fellows', and your own, you shall keep secret; you shall present no one for envy, hatred, or malice; nor shall you leave any one unrepresented for fear, favor, affection, hope of reward or gain; but shall present all things truly, as they come to your knowledge according to the best of your understanding.' After having the oath administered, and receiving an explanatory charge from the judge, they retire to their room, and the various indictments, called bills, duly indorsed with names of witnesses, are laid before them by the state's attorney. The foreman presides, and one of the jurors may be appointed secretary. They do not examine witnesses for the defense; for the duty of the G. J. is not to find a verdict, but only to decide whether there is sufficient *prima facie* evidence to require a trial. For this purpose, they may require the same evidence, written and parol, as may be necessary to support the indictment at the trial. But in practice, having ascertained that the govt. has a sufficient *prima facie* case, they return a true bill, the prisoner's evidence being reserved for the trial. Witnesses are sworn on their examination before the G. J. by an officer appointed by the court. When the jury have come to a conclusion, the clerk indorses on the indictment *a true bill* in case the jury, or a majority of 12, are satisfied that the case is sufficiently strong. In case they are not thus satisfied, the indictment is indorsed *not a true bill*. The foreman, accompanied by one or more of the jurors, then carries the indictments into court, and presents them to the clerk, who states to the court the nature of the charge, and the indorsement of the jury. A bill having been thrown out by the G. J. it cannot be preferred to the same G. J. during the same assizes or sessions. The G. J. must attend till discharged by the court. When a prisoner is brought in after the jury has been discharged, it is competent to swear a new jury.

Although the G. J. has been often complained of as a somewhat superfluous step in the prosecution of offenses and as no longer required, yet it provides an additional safeguard to the liberty of the citizen in all cases. It has, however, been proposed to abolish it when the case has been already before a magistrate, who has like duties to perform.—In Scotland there is no G. J. the duty of inves-

GRAND LAKE—GRAND PENSIONARY.

tigating and bringing to trial in that country being assigned to a public prosecutor: see **ADVOCATE**, **LORD**.

GRAND (or **CHETIMACHES**, *chět-tīm-atch'iz* or *shět-mâsh'*) **LAKE**: in Iberia, St. Martin's, and St. Mary's parishes, La.; supplied by the overflow of Atchafalaya Bayou; about 35 m. long, and 10 m. wide; very shallow, and with no value for navigation.

GRAND (or **SCHOODIC**, *skó'dík*) **LAKE**: body of water forming part of the boundary between the United States and the province of New Brunswick; chiefly in Washington co., Me.; about 25 m. long, and 4 m. wide. It discharges its waters through St. Croix river at the s.e. end, and is famous for trout and land-locked salmon.

GRAND MANAN, *man-ăn'*, or **GRAND MENAN**, *mên-ăn'*: island off the e. coast of Me., in the bay of Fundy, belonging to Charlotte co., New Brunswick; about 22 m. long, and 3-6 m. wide; with n.e. head in lat. 44° 45' n., long. 66° 45' w., and s.w. head in lat. 44° 34' n., long. 66° 53' w. The shores are high and bold; the interior—a high plateau rather than mountainous—is fertile and well timbered, and it has several fine harbors. It has large herring, haddock, and cod-fishery interests, a lighthouse, and many attractions as a summer resort. The chief place is Grand Harbor. Pop. about 3,000.

GRAND MASTER (Lat. *magnus magister*; Ger. *Hochmeister*), the title of the head of the military orders, the Hospitallers, the Templars, and the Teutonic Knights; see these articles. The title originally borne by the superior of the Hospitallers was simply 'master' (*magister*); but in 1268 Hugh de Reval took that by which they are since known—grand master, *magnus magister*. In the Teutonic order, the title 'master,' with different modifications, was applied to the several superiors of the order in the various countries. Thus, the superior of Germany was styled *Deutsch-meister*, 'German master.' The superior of Livonia was called *Heermeister*, 'military master.' In all these orders the office was held for life. The name was also used in the Dominican order.

GRAND MONADNOCK, *mō-năd'nok*: isolated mountain in Jaffrey tp., Cheshire co., N. H., 10 m. s.e. of Keene; composed of slate and talc; about 5 m. long; 3,718 ft. high. Though its height is not great, its isolation renders its appearance particularly striking, and it is visible many miles in every direction. It is considered a part of the White Mountain group, and its summit yields a superb view.

GRAND PENSIONARY. Formerly the syndic of each of the important towns of Holland was termed a pensionary, and the state secretary for the province of Holland, a grand pensionary. Until the time of Olden Barneveldt (q.v.), the grand pensioner, was also advocate-general for the same province. He had no vote in the assembly of the states and could only bring forward the subjects of discussion. He, however, collected the votes,

GRAND-PIERRE—GRAND RAPIDS.

wrote the decrees, read the letters addressed to the states, conducted negotiations with foreign ambassadors and ministers, and took charge of the revenues of the province, of its rights and privileges, and whatever else pertained to its welfare. He was a perpetual member of the states-general of the United Netherlands, and thus, as first magistrate of the first of the United Provinces, he acquired immense influence over all Holland, and may be considered premier of the Dutch parliament. The grand pensionary held his office for five years, but was in most cases re-elected. The office was abolished in 1795, after the conquest of Holland by the French revolutionists.

GRAND-PIERRE, *gröng-pē-är'*, JEAN HENRI, D.D.: 1799–1874; b. Switzerland: leading theologian in the Reformed Church of France. He was educated in the universities of Neufchatel and Tübingen, held a pastorate at Basel, and became pres. and prof. of languages in the Prot. Theol. Seminary at Paris, 1827. While there he was naturalized by Louis Philippe, nominated a member of the Legion of Honor by Napoleon, and given the degree D.D. by Princeton College. He made two tours of the United States, and achieved distinction by his pulpit eloquence. In 1854 he became pastor of l'Oratoire, the chief Prot. church in Paris, remained there till his death, and succeeded Monod as the leader of the orthodox branch of the Ref. Church. He published *A Glance at America* (1850); *Christian Doctrine; Christian Life; Unity and Variety; Sorrow and Consolation; Guide to Faith; Essay on the Pentateuch, and Souvenirs of an Old Pastor*.

GRAND PRÉ, *gröng prā*: village in Horton tp., Kings co., N. S.; on the Windsor and Annapolis railway; 15 m. n.w. of Windsor; area 10 sq. m. It is in a fertile tract of dyked land, was settled by the French 1604, and occupied by Va. colonists 1613; is the seat of a noted seminary, and was the chief scene of Longfellow's *Evangeline*. Pop. about 2,000.

GRAND RAPIDS, *gränd räp'idz*: city, cap. of Kent co., Mich.; at the head of navigation on Grand river; 32 m. from Lake Michigan, 60 m. n.w. of Lansing; on 9 lines of railroad. It is in a rich agricultural and fruit-growing region, has large manufacturing and commercial interests, is an important shipping point for pine and hard-wood lumber, and has vast quarries of gypsum in its immediate vicinity. In 1900 it had 824 manufacturing establishments, employing a capital of \$23,433,760, and 14,361 hands, paying wages of \$5,904,670, yielding products valued at \$24,824,042. The chief manufactures were furniture (cap. invested \$8,300,000), men's and women's clothing, confectionery, patent medicines and compounds, printing and publishing, hosiery and knit goods, bakery products, flour and mill-machinery, furs, bricks, etc., (the gypsum quarries yield 100,000 barrels of stucco and 100,000 tons of land-plaster per annum), wagons, carriages, stoves, brushes, woodenware, bicycles, leather, felt boots, carpet-sweepers, agricultural imple-

GRAND RIVER—GRAND SERGEANTY.

ments, and electric supplies. G. R. contains a public library, free law library, 2 electric-light and 2 water companies, 1 gas company, 37 pub. schools, 5 national banks (cap. \$2,200,000) and 2 state banks (cap. \$200,000), 26 periodical publications, and 74 churches divided denominationally as follows: Meth., 12; Ref. 18; Lutheran, 4; Bapt., 6; Rom. Cath., 7; Congl., 4; Prot. Episc., 4; Presb., 4; Unit. 2; and Disciples, Church of Christ, Jew., Ind., Swedenborgian, and Univ., each 1.

The public buildings comprise a U. S. court-house and post-office; city-hall, completed 1887 at cost of \$300,000; and the usual structures of a co. seat. In 1887 work was begun on a \$200,000 building for a co. court-house and other co. offices, and a \$500,000 union depot was also erected on a \$250,000 plot of ground. There are also 10 private schools, 2 public parks, a street-railway system, paid fire dept., and a costly system of reservoir water-works. A fall of 17 ft. in a distance of 2 m. in Grand river gives G. R. excellent water-power for manufacturing purposes.—About 1760 a largely populated village of Ottawa Indians was situated on the bank of Grand river about $\frac{1}{2}$ m. below the rapids, and a great council was held there 1761, at which Pontiac presided, when the Sachems promised to aid him in a siege of Detroit. In 1823 Isaac McCoy went to the village as the first missionary, but though arrangements had been made with the Indians for the establishment of missions among them, he failed to secure the favor of the Ottawa chief. In 1824 the Rev. L. Slater was permitted to open a Bapt. mission there, and 10 years later the village began growing rapidly. The first town-meeting was held 1834, the first white school and the first newspaper were established 1837; the town had an area of 40 acres 1846, was incorporated 1850, and occupied an area on both sides the river of $9\frac{1}{2}$ sq. m. 1889. Pop. (1870) 16,000; (1880) 33,000; (1884) 41,898; (1890) 60,278; (1900) 87,565.

GRAND RIVER: tributary of the Colorado river, rising in Grand Lake in the n.e. part of the Middle Park, flowing in a w.s.w. direction, crossing the w. boundary of Colo., thence flowing s.w., and uniting with the Green river in Utah. Its chief tributaries are the Gunnison and Dolores rivers. It is about 350 m. long, and in Middle Park runs through a granite cañon for 3 m. between walls 1,000–1,500 ft. high.

GRAND RIVER: river of Michigan, rising in the s.e. part of the state, in two branches which unite near the city of Jackson; thence flowing in a general w.n.w. direction, and emptying into Lake Michigan at the city of Grand Haven (q. v.). G. R. is navigable for large steamers to the rapids, 40 m. from its mouth, and for small boats 50 m. further; whole length 270 m.

GRAND SERJEANTY [Lat. *magna serjeantia*, or *magnum seroitium*, great service]: the most honorable of the ancient feudal tenures. According to Lyttleton, tenure by G. S. in Britain is where a man holds his lands or tene-

GRANDVILLE.

ments of the sovereign lord the king by such services as he ought to do in his proper person to the king, as to carry the banner of the king, or his lance, or to lead his army, or to be his marshal, or to carry his sword before him at his coronation, or to be his carver, or his butler, or one of his chamberlains of the receipt of his exchequer, or to do other like services. This tenure must have been held of the king. Where lands were held of a subject, on condition of performance of services identical with those which were rendered to the king, the tenure was not G. S., but knight's service. Thus, lands on the Scottish border held of the king by cornage, i.e., on condition of winding a horn to give notice when the Scots had crossed the border—where held in G. S.; but lands held of a subject for the same service where held in knight's service. The services in G. S. were to be performed by the tenant in person, where he was able to do so. The office of attendance on the sovereign's person was esteemed so honorable, that no one below the dignity of a knight could perform it. This tenure by G. S. was by 12 Charles II. c. 24, in common with other military tenures, reduced to common Socage (q. v.), except as regards the honorary services, which continue to be observed to this day. Thus, the Duke of Wellington holds of the crown his estate of Strathfieldsaye on condition of presenting to the sovereign a flag bearing the national colors on each succeeding anniversary of the battle of Waterloo. The manor of Woodstock, with the demesne, in which is Blenheim Park, is held by the Duke of Marlborough by G. S., on condition of presenting to the queen and her heirs, at the castle of Windsor, a standard of France, on Aug. 13 yearly, the anniversary of the day on which the battle of Hochstädt was fought, near the village of Blenheim, on the Danube. The tenure of G. S. was observed throughout Europe. 'The freeborn Franks,' says Mr. Hallam, *Middle Ages*, 'saw nothing menial in the titles of cupbearer, steward, marshal, or master of the horse, which are still borne by the noblest families in every country in Europe, and by sovereign princes in the empire. The Count of Anjou, under Louis VI., claimed the office of great seneschal of France—i.e., to carry dishes to the king's table on state-days. Thus, the feudal notions of grand serjeanty prepared the way for the restoration of royal supremacy, as the military tenures had impaired it.'

GRANDVILLE, *grâng-vîl'*, JEAN IGNACE ISIDORE GÉRARD (name GÉRARD, pseudonym GRANDVILLE): 1803, Sep. 3—1847, Mar. 17; b. Nancy: French caricaturist. In 1828 he published the first of a series of humorous sketches, *Les Métamorphoses du Jour*, which were highly thought of; soon afterward another series, *Les Animaux Parlants*. After the July revolution, G., with Decamps and Daumier, became the moving spirit of the 'Caricatures.' His *Convoi de la Liberté*, his *Basse Cour*, *Mat de Cocagne*, etc., as pictures of the politics and manners of the times, are of great and lasting value. He also contributed illustrations to new and splendid editions of the *Fables* of La Fontaine and Florian, the *Adventures of Robinson Crusoe*, *Gulliver's Trav-*

GRANE—GRANGER.

els, Abel Hugo's *Vie de Napoleon*, Raybaud's *Jérôme Paturot*, etc. Though some of G.'s designs are absurd, his work in general shows high inventive power and great refinement.

GRANE, or GRAN, *grân*, or QUADE, *kwād*: seaport of Arabia, at the n.w. extremity of the Gulf of Persia. Pop. estimated about 8,000.

GRANGE, n. *grānj* [F. *grange*, a barn; Span. *granja*, a farm—from L. *granum*, corn: comp. Gael. *grainnseach*, a depository for grain]: a granary; a farmhouse, or more broadly a rural estate with its attached buildings. In the United States since 1867, name applied to the state and subordinate organizations of the national agricultural association, Patrons of Husbandry, whose members were called *Grangers*: see HUSBANDRY, PATRONS OF.

GRANGEMOUTH, *grānj'mūth*: rising port in Stirlingshire, Scotland, 3 m. from Falkirk, at the entrance of the Forth and Clyde canal. It is on the Carron river, nearly 2 m. from its mouth on the estuary of the Forth. The trade of G. has rapidly risen of late years. It has extensive quays and warehouses; docks (including a large one opened 1882, and a graving-dock) and ship-building yards. A public park was opened 1882. The imports are timber, hemp, flax, tallow, deals, iron, grain; and iron, corn, and wool are exported. (1880) 3,384 vessels, of 841,160 tons entered and cleared the port. Pop. (1871) 2,569; (1881) 4,560; (1891) 5,833.

GRANGER, *grān'jēr*, GIDEON: 1767, July 19—1822, Dec. 31; b. Suffield, Conn.: statesman. He graduated at Yale College 1787, attained wide distinction as a lawyer, served several years in the state legislature, was one of the originators—if not the author—of the Conn. School Fund, was U. S. postmaster-gen. 1801–14, removed to Canandaigua, N. Y. and became state senator 1819, co-operated with De Witt Clinton in establishing his system of internal improvements, and retired from public life 1821.—His son, FRANCIS G. (1792, Dec. 1—1868, Aug. 28), graduated at Yale College 1811, became a lawyer, was whig candidate for vice-pres. of the United States on the ticket with William Henry Harrison 1836, was member of congress 1835–37, 1839–40, appointed U. S. postmaster-gen. 1841.

GRAN'GER, GORDON: 1821–76, Jan. 10: b. New York: soldier. He graduated at the U. S. Milit. Acad. 1845, was brevetted 1st lieut. and capt. for services at Contreras, Churubusco, and Chapultepec; appointed col. 2d Mich. cav. 1861, Sep. 2; brevetted maj. U. S. A. for gallantry at Wilson's Creek, Mo.; promoted brig.gen. 1862, Mar. 26, and maj.gen. Sep. 17; brevetted lieut.col. and col. U. S. A. for Chickamauga and Chattanooga, brig.gen. for Mobile, and maj.gen. for Forts Gaines and Morgan; mustered out of the vol. service 1866, Jan. 15; appointed col. 25th U. S. inf. 1866, July, transferred to the 15th U. S. inf. 1870, and commanded it and the dist. of N. Mex. till his death.

GRAN'GER, ROBERT SEAMAN: soldier: b. Zanesville, O., 1816, May 24. He graduated at the U. S. Milit. Acad.

GRANGERISM—GRANIER DE CASSAGNAC.

1838, served in the Seminole war, was asst. instructor of tactics at the U. S. Milit. Acad., was promoted capt. for services in Mexico, and performed frontier duty till 1861, Apr. 27, when he was captured by the Confederates in Tex. He was appointed brig.gen. of Ky. state troops 1862, Sep. 1, brevetted col. U. S. A. for services at Shepherdsville, Lebanon Junction, and Lawrenceburg; promoted brig gen. vols. 1862, Oct. 20; commanded dists. of Nashville and Middle Tenn. 1863, superintended the defenses of Nashville 1864, successfully defended Decatur against a Confederate siege 1864, Oct., brevetted maj. gen. U. S. A., promoted lieut.col. 1865, June 12, and col. 1871, Aug. 16, and placed on the retired list 1873, Jan. 1. He d. 1894, Apr. 25.

GRANGERISM, n. *grānj'ér-izm*: practice, known since the 18th c., of illustrating a book with engravings torn from others: named from the delight which bibliophiles took in thus illustrating Granger's *Biographical History of England*. GRANG'ERITE, one who mutilates books for the purpose of illustrating other books.

GRAN GUSTO, n. *grān gós'tō* [It.]: in *mus.*, elevated taste or expression; in *paint.*, anything in a picture very extraordinary.

GRANICUS, *gra-nī'kūs*: ancient name of a small river in the n.w. of Asia Minor, flowing from the n. side of Mount Ida to the Propontis, and now known as the Kod-sha-su. The G. is noted as the scene of the first victory of Alexander the Great over the Persians after he crossed the Hellespont, B.C. 334

GRANIER DE CASSAGNAC, *grā-nē-ä' deh kâ-sân-yák'*, BERNARD ADOLPHE: Parisian journalist, and political partisan: 1803-1880, Jan. 30; b. at Averon-Bergelle, in the dept. of Gers. He was educated at the College of Toulouse, and soon quitting the provinces for Paris, was introduced by Victor Hugo to the *Journal des Debats* and *Revue de Paris*. Here his vehement style did not give satisfaction, and he was engaged by M. Girardin to write literary criticisms for *La Presse*. In 1840, he sailed for the Antilles, in hopes of political advancement, ingratiated himself with the planters, though he narrowly escaped being murdered by the blacks, married a Creole lady, Mademoiselle Beauvallon, and returned to Paris as deputy for Guadeloupe. He founded the *Globe*, ultra-Orleanist, and violent to such a degree that the opposition journals agreed to ignore it (*la conspiration du silence*, as it was called). The *Globe* failed; and 1842 G. de C. started *L'Epoque*, also violent, and a failure. In 1848 he returned to France from a short stay in Rome, and soon reappeared in Paris as an ardent supporter of Louis Napoleon the Prince President, and a bitter foe to his old patrons, the House of Orleans. He edited the *Pouvoir* (1850), and wrote for the *Constitutionnel* with an excess of zeal and a pretense of exclusive information. In 1852, he was elected as the govt. candidate for Mirande (Gers), and re-elected 1857, 63. 1857, he was made grand officer, and 1865 commander of the Legion of Honor.

GRANIER DE CASSAGNAC.

1867 he founded *La Réveil*, weekly religious organ, which died the next year. He afterward became principal editor of the semi-official *Pays*, and 1863 manager of the *Nation*. 1870, on the fall of the empire, he retired to Brussels; 1876 he was elected to the national assembly. The appearances of G. de C. before the courts of justice were very numerous. 1842 he was tried for a duel with M. Lacrosse; 1845, he prosecuted M. Hilbey for libel; 1847, he was concerned in the duel in which his brother-in-law, Beauvallon, killed Dujarrier of *La Presse*, about which strange things were said. He was sued by Delasalle for a debt which he declared he had paid: Delasalle gained his cause. 1855, his publisher proceeded against him for non-delivery of a ms. on the eastern war. The duel between his son, Paul de C. of the *Pays* and a writer of the *Soleil* (in which G. de C. seconded his son), and the unseemly quarrel between the Cassagnacs and M. Vermoul of the *Courrier Français*, were matters of great notoriety. His most important works are: *A Voyage to the Antilles* (1844); *The Queen of the Prairies*, romance (1845); *The Causes of the French Revolution of 1789* (1850); *The History of the Directory*, reprint from the *Constitutionnel* (1851-56); *The Fall of Louis Philippe* (1857); *The Girondins and the Massacres of September* (1860), etc. All his writings are remarkable for vigor of style, but the partisanship greatly impairs their value.

His son PAUL DE C. (b. 1840 or 41) has been noted, like his father, for fierce and bitter personality in political journalism, and has fought several duels. He was returned 1876 and 7 to the national assembly, from Gers.

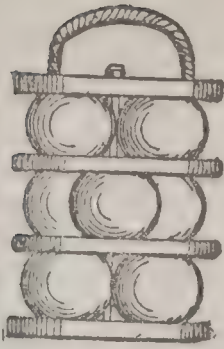
GRANITE.

GRANITE, n. *grăn'it* [F. *granit*, granite—from It. *granito*, kernelly or gritty, as figs or oil in winter: L. *granum*, grain, corn]: plutonic rock, having a granular-crystalline composition and appearance, and composed of quartz, felspar, and mica, in grains or crystals. **GRANITIC**, a. *gră-nit'ik*, or **GRANITIC**, a. *-i-kal*, partaking of the character and appearance of granite. **GRANITOID**, a. *-it-oyd* [Gr. *eidos*, likeness]: applied to such rocks as have the granular-crystalline aspect of granite. **GRAPHIC GRANITE**, *graf'ik*- [Gr. *graphō*, I write]: a compound of felspar and quartz, the quartz being disposed through the felspar matrix like lines of Arabic writing.

GRANITE: igneous rock, composed of the three minerals, quartz, felspar, and mica, united in a confused crystallization; i.e., without regular arrangement of the crystals. The felspar is the most abundant, and the proportion of quartz is greater than of mica. G. differs from greenstone and the later igneous rocks, in the large quantity of quartz in its composition. In the trappean and other igneous rocks, the silica or silicic acid is only sufficient for union with the bases to form felspar and hornblende, the constituents of these rocks, with no remainder free to crystallize as pure quartz; while in G., so great is the excess of siliceous matter, that in its pure state, as quartz, it forms a considerable bulk of the rock. G. is always a compact rock, it never passes into or alternates with tuffs or breccias. This peculiarity, associated with its crystalline structure, and the absence of cellular cavities, such as are produced in trappean and volcanic rocks by the expansion of the contained gases, have led to the belief that G. has been formed at considerable depths in the earth, and has crystallized slowly under great pressure either from superimposed strata or from deep seas. On this account the granitic rocks have been called 'Plutonic rocks,' and Lyell has applied to them the term 'hypogene,' from *upo*, under, and *ginomai*, to be born. It was formerly supposed that all granitic rocks were formed before the deposition of any of the sedimentary strata; hence they were named 'Primitive rocks.' But this name has been discarded, since it was found that G. is associated with formations of various ages, and that even since the beginning of the tertiary epoch its intrusion among the eocene strata of central Europe has raised the Alps more than 10,000 ft. above the level of the level of the sea. Although G. is not absent from the secondary and tertiary strata, it is more frequently associated with the palæozoic formations; indeed, it appears to be the fundamental rock of the earth's crust. Wherever we reach the base of the stratified rocks, we find them resting on G.; and whatever the age of the strata thus lying on this igneous rock, we have no reason to suppose that below the G. there occur beds of older date; for, though G. penetrates the stratified rocks, it has not been noticed to spread over them like greenstone, so that wherever it presents itself in a large mass, it is believed that no other rock is beneath it. Some granites, however, occur interstratified with undoubted sedimentary rocks, and



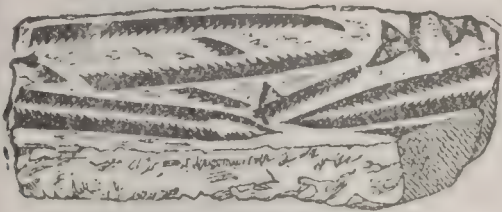
Grape-shot.



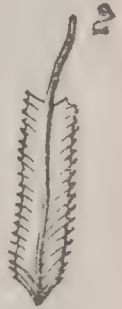
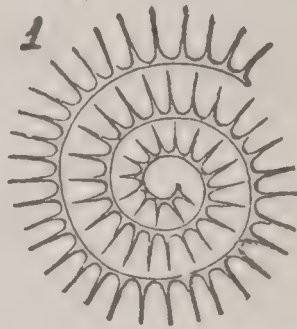
Grape-shot.
Another specimen.



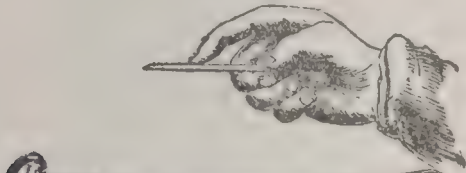
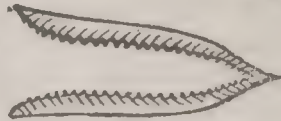
Grapnel.



Block of Stone containing Graptolites.



3



Graver, and Mode in Which it is Held.

Graptolitidæ. — 1, *Bastrites peregrinus* (Barraude); 2, *Diplograpsus folium* (Hisinger); 3, *Didymograpsus Murchisoni*.



Great-crested Grebe (*Podiceps cristatus*), and Nest.

GRANITE.

it is argued that, as the transition from these sedimentary rocks to the crystalline G. can be traced by gradual stages through mica schist and gneiss, the G. is only the final stage of these metamorphic changes. Many of the granites of Scotland are accordingly believed to be older palæozoic sediments greatly altered. It is not maintained that all granites have such an origin; but no lithological character has yet been observed whereby the igneous G. can be distinguished from that produced by metamorphic action.

Large extents of the earth's surface are covered with granites; occasionally, it is the superficial rock in flat undulating plains, but appears most frequently in mountainous regions. It is probable that sometimes igneous G. has been raised from below as a solid indurated rock; it has, however, generally been in fluid condition, as is evidenced by the number of veins protruded from it into the adjacent rocks.

The varieties of G. depend on the number and quantity of its mineral constituents, and on the state of aggregation of these materials. Ordinary G. is composed of felspar, mica, and quartz. The felspar may be either the flesh-colored potash variety, orthoclase; or the pure white soda variety, albite; or both potash and soda may enter its composition. The mica varies in color from pure silvery white, through the more common brown, into black. The quartz is generally white, seldom dark-gray or brown. The predominance of one or other of the ingredients, or of a particular variety, gives the peculiar color to the mass, which is generally either red, gray, or white. The red is produced from the predominance of orthoclase; the white, of albite; and the intervening gray from the mica, sometimes from the quartz. The felspar forms generally a half, sometimes even more of the bulk of the rock; the mica in one variety, and the quartz in another, are so minute as to be scarcely visible. Sometimes the felspar separates into large and distinct crystals forming a porphyritic G. The substitution of hornblende for mica produces the variety called syenite (q.v.); and if talc takes the place of the mica, the rock is called protogene (q.v.). When the ingredients exist in a compact and finely granular condition, the compound is known as eurite. Sometimes, especially in veins, felspar and dark quartz are arranged so as to produce an imperfect laminar structure, which, when broken at right angles to the laminæ, presents numerous broken and angular lines that have a faint resemblance to Hebrew characters, whence it is called graphic granite.

G. is a building material whose expensiveness in working is counterbalanced by its great durability; hence it is much used in bridges and great public works. It cannot be cut, like the majority of building-stones, with saws, but is worked first with large hammers, and then with pointed chisels. The success with which the Egyptians operated on this refractory stone is very extraordinary. They worked and polished it in a way which we cannot excel, if, indeed, we can equal it, with all the appliances of modern science; and not content with polishing, they covered

GRANIVOROUS—GRAN SASSO D'ITALIA.

some of the blocks with the most delicate and sharply cut hieroglyphics. Red G. is largely quarried on the coast of Maine, also G. of other colors; and gray G. at Concord, N. H., Quincy, Mass., and on Cape Ann which is a mass of G. projecting for miles into the Atlantic.

The soil produced by the weathering of granitic rocks should be fertile, as their chemical composition contains the necessary elements. The great hardness of the rock, and its resistance to atmospheric influences, prevent a soil of any thickness being formed; and even where it exists, at least in temperate regions, it is generally so high and exposed, that it is unfavorable to vegetation; in warmer climates, such soils are frequently very fertile.

GRANIVOROUS, a. *grān-ivō-rās* [L. *granum*, a grain or seed; *voro*, I devour]; living upon grains or other seeds.

GRANMICHELE, *grān-mā-kā'lā*, or **GRAMMICHELE**: town of Sicily, province of Catania, 30 m. s.w. from Catania, on a mountain ridge, 1,758 ft. above the sea. Beautiful marbles are produced in the neighborhood. The town was founded in the end of the 17th c. by the Branciforte family, and peopled with the inhabitants of the neighboring town of Occhialà, which was destroyed by earthquake 1693. Pop. 12,000.

GRAN SASSO D'ITALIA, *grān sās'sō dē-tā'lē á* ('Great Rock of Italy'), also called **MONTE CORNO**, from the resemblance to a horn which it presents on the east: highest summit of the Apennines, elevation 10,206 ft. It is on the borders of the Abruzzi, between Teramo and Aquila. It owes its name partly to its height, and partly to its being formed of a single mass of calcareous earth from its middle to its summit. It is seen to great advantage from the side of Teramo, where it is broken into tremendous precipices. The summit is covered with perpetual snow. Wolves, bears, and chamois abound on the mountain—the chamois being found in no other part of the Apennines. The general character of the scenery is more Alpine than Apennine, and in wild grandeur and variety it is not surpassed by any landscape in Italy. To the painter, geologist, and botanist it affords a rich field. See *Itinerary of F. Caldane*.

GRANT.

GRANT, *v.* *grănt* [OF. *cranter*, to confer an advantage—from mid. L. *gratum*, consent; *grantum*, satisfaction: or OF. *craanter*, to assure—from L. *creden tiā*, trust, assurance]: to admit as true what has not been proved; to give or bestow something which cannot be claimed by right; to concede: *N.* the thing conferred on or conveyed to; an allowance; concession; admission; in *law*, the conveyance of real property by deed—now applied to estates corporeal as well as incorporeal. **GRANTING**, *imp.* **GRANTED**, *pp.* **GRANTER**, *n.* one who. **GRANTABLE**, *a.* *-ā-bl*, that may be granted. **GRANTEE**, *n.* *-tē*, the person to whom anything is conveyed or granted. **GRANTOR**, *n.* *-tōr*, in *law*, one by whom a grant is made.—**SYN.** of ‘grant, *v.*’: to confer; give; convey; bestow; transfer; admit; allow; yield; cede.

GRANT, Mrs. **ANNE** (Mrs. Grant of Laggan): miscellaneous writer: 1755, Feb. 21—1838, Nov. 7; b. Glasgow; daughter of a british officer named M’Vicar, who became barrack-master of Fort Augustus. She married the Rev. James G., chaplain of the fort, subsequently minister of Laggan. Left a widow in destitute circumstances, Mrs. G. published by subscription a volume of *Poems* (1803) which were well received; 1806, *Letters from the Mountains*—a highly popular work; 1808, *Memoirs of an American Lady* (Mrs. Schuyler, with whom the author spent four years of her childhood in America); 1811, *Essays on the Superstitions of the Highlanders of Scotland*, etc. In 1825, Mrs. G. received from government a pension of £100 a year.

GRANT, **CHARLES**, Lord **GLENELG**: 1779–1866; b. in India, at Kidderpore, presidency of Bengal; of a Highland family. The father of Lord Glenelg (also Charles G., 1746—1823) went early to India, represented for many years the county of Inverness in parliament; and was with Wilberforce, Thornton, Zachary, Macaulay, and others, a member of the Clapham sect, described by Sir James Stephen in *Ecclesiastical Essays*. Charles, the eldest son, took his degree M.A. 1804 at Magdalene College, Cambridge. He was called to the bar 1807, but never practiced. In 1811, he was elected M.P. for the Inverness district of burghs; and he continued in the house of commons for 25 years, and then was raised to the peerage. G. was for five years a lord of the treasury; and in 1819–21 sec. for Ireland. As secretary for Ireland he sought conciliatory measures, such as suppressing the Orange demonstrations, securing impartial administration of justice, and devising a system of national education adapted for Rom. Catholics as well as Protestants. G. was vice-pres. of the board of trade 1823–27; president of the board of control 1830–34; and sec. of state for the colonies 1834–39. He supported the liberal party by his vote. He died at Cannes, in France. Some of his dispatches as colonial sec., on the rights of the natives in the colonies, on repressing idolatry, and abolishing slavery throughout the British possessions in s. Africa, are models of elevated and just thought, and of fine impressive English.

GRANT.

GRANT, Sir FRANCIS: 1803-1878, Oct. 5; b. Edinburgh; fourth son of Francis G. of Kilgraston, Perthshire. He received his education at Harrow and at the Univ. of Edinburgh, and it is said had in view the Scottish bar, but soon turned to follow his natural genius for painting. A noble portrait by Velasquez in Lord Elgin's gallery is said to have exercised especial influence over the young painter's art-career. His first picture at once gave him rank among the best portrait-painters of the day. His most famous works are those in which he has combined the likenesses of distinguished characters with scenes of English sport. The *Meet of H. M. Stag-hounds*, painted 1837 for Lord Chesterfield, containing 46 portraits (winning a gold medal at Paris 1855); the *Melton Hunt*, for the Duke of Wellington; and the *Cottesmore*, for Sir R. Sutton, are best known in this class. Other paintings were equestrian portraits of the Queen and Prince Consort for Christ's Hospital; the picture of the beautiful Marchioness of Waterford; and those of Lords Palmerston, Russell, Gough, Macaulay, Hardinge, etc. In 1842, Mr. G. was elected assoc., 1851 academician, and 1866 pres. of the Royal Academy. Soon afterward he received, according to ancient precedent, the honor of knighthood. In 1870 he received the degree of D.C.L. from Oxford.

GRANT, FRANCIS, Lord CULLEN: Scottish judge and political writer: abt. 1660-1726; son of Archibald G. of Belinton, cadet of the family of Grant of Grant, chief of the clan of that name. He was educated at Aberdeen, afterward at Leyden. He wrote in favor of the Union, on the Observance of the Sabbath, on the Law of Patronage in the Church, essays on Law, Religion, and Education, and Reflections on the Rebellion of 1715. He died at Edinburgh.

GRANT, JAMES, of Corrimony, in Inverness-shire, Scotland: 1743-1835: author of *Essays on the Origin of Society*, 1785 and *Thoughts on the Origin and Descent of the Gael*, 1814. The latter is a learned and ingenious work, imbued with Celtic feeling and enthusiasm.

GRANT, *gränt*, Sir JAMES HOPE, G.C.B.: 1808, July 22—1875, Mar. 7; b. Kilgraston, Perthshire, Scotland: soldier. He entered the British army as cornet 1826, was brigade-maj. during the first Anglo-Chinese war, took part in the Punjaub campaign, and commanded his regt. at Chillianwallah and Goojerat 1848-9, was brevetted col. 1854, promoted maj.gen. and nominated K.C.B. for his services as commander of the cavalry div. at the siege of Delhi, the relief of Lucknow, and the operations at Cawnpore 1858; commanded the whole British force in China 1859 and captured Peking 1860. For his brilliant conduct he received the thanks of parliament and was nominated G.C.B. In 1861 he was promoted lieut.gen. and appointed commander-in-chief at Madras; 1867 was made quarter-master-gen., and 1871 commander of the div. at Aldershot. He published *Incidents in the Sepoy War*, 1857-8 (London 1874).

GRANT.

GRANT, MRS., of Carron: 1745-1814; b. near Aberlour, Banffshire, Scotland: author of the popular Scotch song *Roy's Wife of Aldivalloch*. She was twice married—first to her cousin, Mr. G. of Carron, near Elchies, on the river Spey; secondly, to Dr. Murray, physician in Bath. She died at Bath.

GRANT, PATRICK, Lord ELCHIES: 1690-1763; Scottish judge. He collected the Decisions of the Court of Session 1733-57, and wrote annotations on Lord Stair's Institutes. His son, John G., became one of the barons of exchequer in Scotland.

GRANT, Sir ROBERT, governor of Bombay: 1785-1838; brother of Charles G., Lord Glenelg. In 1801, the brothers took their degree B.A. together in Cambridge. Robert was called to the bar at Lincoln's Inn 1807, sat for some time in the house of commons as member for Inverness, afterward for Norwich and for Finsbury. In 1834, he was knighted, and appointed gov. of Bombay. He died at Dapoorie. He was the author of two treatises on Indian Affairs, and of some admired hymns.

GRANT, ULYSSES SIMPSON (originally HIRAM ULYSSES), 18th President of the United States: 1822, Apr. 27-1885, July 23; b. Point Pleasant, Clermont co., O. He was the oldest of 6 children of Jessie R. G. and Hannah Simpson G., and spent his boyhood working on the farm and in the tannery of his father, and attending the village school. In 1839 he entered the U. S. Military Acad., where his name was erroneously entered as Ulysses S., the S. being supposed to represent his mother's family name. As the officials declined his request to correct the name he was forced to assume it and was thereafter known by it. He graduated 21st in a class of 39, was commissioned brevet 2d lieut. and assigned to the 4th U. S. inf. at Jefferson barracks 1843. In 1844 he went with his regt. to La.; 1845 was promoted 2d lieut. and joined Gen. Taylor's army of occupation in Mexico; 1846 took part in the battle of Palo Alto May 8, and Resaca de la Palma as commander of his company May 9, joined the army at Monterey, Mexico, Sep. 19. and performed several acts of heroism before that city; 1847 served through the siege of Vera Cruz, Mar., was in the battle of Cerro Gordo Apr. 17-18, entered Pueblo May 15, and took part in the capture of San Antonio and the battle of Churubusco Aug. 20, the battle of Molino del Rey Sep. 8, the storming of Chapultepec Sep. 13, the operations against Mexico City, and the occupation Sep. 14. He was promoted 1st lieut. 1847, Sep., remained with the troops in Mexico City till the withdrawal 1848, July, went with his regt. to Pascagoula, Miss., married Julia B. Dent 1848, Aug. 22, and served at Sackett's Harbor, N. Y., Detroit, Benecia Barracks, Cal., Fort Vancouver, Or., and Humboldt Bay, Cal., till 1854, July 31, when he resigned his captain's commission, and engaged in farming near St. Louis. His success was not financially great, and in 1860 he removed to Galena, Ill., and entered his father's hardware and leather store as

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clerk, and was so employed with very limited wages when the civil war broke out. Four days after Pres. Lincoln's first call for vols., G. organized a co. in Galena. He offered his services to the war dept., and failing to receive a response, drilled his co., took it to Springfield, Ill., where Gov. Yates engaged him to organize vol. troops, and he was commissioned col. of the 21st Ill. inf. 1861, June 17. In July he reported to Gen. Pope in Mo., Aug. 7, was appointed brig.gen. of vols., and Sep. 1 was placed in command of the dist. of S. E. Mo., with head quarters at Cairo. Without awaiting instructions, he entered at once upon an energetic campaign, and by his prompt seizure of Paducah (Sep. 6) saved Ky. to the Union. In Nov. he made a demonstration at Belmont to prevent the Confederates sending troops from Columbus to reinforce Gen. Sterling Price, then advancing into Mo.; and spent Dec. and Jan. (1862) planning and urging on the war dept. a joint army and naval expedition against Fort Henry on the Tenn. river. He received the desired orders Feb. 1, and in conjunction with Com. Andrew Hull Foote (q.v.) began the movement on the next day. (See DONELSON, FORT.) For his victories at Forts Henry and Donelson—the first substantial victories on the national side—G. was promoted maj.gen. of vols. He proposed following up his advantage and started for Nashville Feb. 28, but was suddenly deprived of command and ordered to remain at Fort Henry. On Mar. 13 he was as suddenly restored to command, in consequence of the concentration of Confederate armies near Corinth, Miss., and was ordered to move up the Tenn. river toward the Confederate rendezvous, but not to attack. He established his lines near Shiloh, or Pittsburg Landing, and while awaiting the arrival of Gen. Buell's army was attacked by 50,000 Confederates from Corinth under Gen. Beauregard. The first attack Apr. 6, found G. at a disadvantage on account of the distance of his supporting troops from his main body; but after Buell's arrival with 40,000 men both armies united, and Apr. 7 attacked the Confederates, drove them in retreat to Corinth, thwarted Beauregard's intention of overwhelming G., and held their ground. (See CORINTH, BATTLES OF.) After this victory G. proposed an immediate movement against Vicksburg. After waiting in vain for orders he started without them Nov. 3. He seized Grand Junction, La Grange, Holly Springs, and Oxford, ordered Gen. Sherman to move down from Memphis to attack Vicksburg, and prepared to co-operate with him by land. The unfortunate surrender of Holly Springs, with its large stores, entirely frustrated his designs, and compelled him to abandon the campaign. In 1863, Jan., G. took command of all the troops in the Miss. valley, and established himself at Memphis, preparatory to making another attempt on Vicksburg. Failing in several plans, he sent the gunboats and transports down the river past the batteries Apr. 16, 29, and threw his army across the river at Bruinsburg, 30 m. s. of Vicksburg, Apr. 30. Two Confederate armies opposed him, Pemberton's of 50,000 men at Vicksburg, and Johnston's of 43,000 at

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Jackson. On May 1 he defeated a portion of Pemberton's force at Port Gibson, May 12 routed part of Johnston's army, May 14th captured Jackson and scattered Johnston's army, May 16 defeated Pemberton at Champion Hill, May 17 defeated him again at Black River Bridge, and May 18 drove him into Vicksburg. He made unsuccessful assaults upon the city May 19, 22, began siege operations May 23, and received the surrender of the stronghold with 31,600 prisoners and 172 cannon July 4. During the whole campaign the Confederates lost 40,000 prisoners, 12,000 in killed and wounded, and 8,000 by disease and straggling, while G. lost a total of 8,873. The surrender of Port Hudson to Gen. Banks soon followed, and the Miss. river was thus opened its entire length. For his Vicksburg victory G. was commissioned maj.gen. in the regular army, and Oct. 16 was placed in command of the military div. of the Miss. river, which included the armies of the Ohio, Cumberland, and Tennessee. Oct. 27 he gained the battle of Lookout Valley, and Nov. 23, 24, 25 those of Chattanooga. (See CHATTANOOGA, BATTLES OF.) The rank of lieut.gen. was revived by congress 1864, Feb. G. was nominated for the office Mar. 1, confirmed Mar. 2, and given command of all the armies of the United States Mar. 17. He then determined to march against the army of N. Va. under Gen. Lee, while his subordinates operated against the remaining Confederate armies. He ordered Gen. Sherman to move against Atlanta, Gen. Banks against Mobile, Gen. Butler up the James river toward Richmond, Gen. Sigel to penetrate the valley of Va., and Gen. Meade with the army of the Potomac to cover Washington. All the armies moved at the same hour on May 4. G. personally crossed the Rapidan, encountered Gen. Lee in the Wilderness, and fought a desperate series of battles May 5, 6, 7. After the battles of the Wilderness came those of Spottsylvania, North Anna, and Cold Harbor, and by the time G. reached the James river he had lost 6,000 killed, 26,000 wounded, and nearly 7,000 missing. (See COLD HARBOR (SECOND) BATTLE OF; CHICKAHOMINY, BATTLES OF.) June 13, 14, 15, 16, G. threw his army across the James river to operate against Petersburg and Richmond, and established his headquarters at City Point. Assaults were made on Petersburg June 15, 16, 17, 18, and important outworks were captured. Gen. Sheridan, by a series of bold cavalry raids, drove the enemy from the valley of Va., and other generals kept the subordinate Confederate armies so occupied that they could render Gen. Lee no assistance, while G. succeeded in so surrounding and harassing Gen. Lee and threatening Richmond that the Confederate chief could spare neither man nor gun to the generals hard-pressed elsewhere. During the remainder of 1864 the Confederate Gen. Early made a dash for Washington (July 11), but in the face of the 6th corps hurriedly sent to its relief did not attack; Sheridan routed Early at Winchester (Sep. 19); Butler took Fort Harrison at Deep Bottom (Sep. 29), and held it against attempts to retake it; Meade gained important advantages on the line of the Weldon railroad (Oct.

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1, 2); Sheridan turned defeat into victory over Early at Cedar Creek (Oct. 19); and Butler made an unsuccessful attempt to capture Fort Fisher (Dec. 25). The capture of Fort Fisher by the army and navy 1865, Jan. 15, the defeat of Early by Sheridan at Waynesboro Mar. 2, and the great victory of Sheridan at Five Forks, Apr. 1 (see FIVE FORKS, BATTLE OF), created for G. the opportune moment for the final campaign of the war. He had an aggregate force of 110,000 men before Petersburg and Richmond, and Gen. Lee had 73,000 men at Richmond and a militia and gunboat force of 5,000 more. G. assaulted Petersburg at daylight Apr. 2, secured Forts Gregg and Whitworth in the afternoon, and occupied the city at night. Richmond surrendered the next day, Lee fled toward Lynchburg, but was surrounded at Appomattox Court-house, and forced to surrender Apr. 9. Johnston surrendered to Sherman Apr. 26, Mobile was evacuated Apr. 11, Macon surrendered Apr. 21, and Gen. Kirby Smith surrendered his army w. of the Miss., Apr. 26. Thus was the war closed. Honors without precedent were bestowed upon G. Congress created for him the grade of general, and swords and residences were presented him by corporations and private citizens. But he was not destined to enjoy the leisure his prowess had won. The assassination of Pres. Lincoln entailed upon G. a conflict with the successor to the presidency, Andrew Johnson. He was sec. of war in Pres. Johnson's cabinet 1867, Aug. 12—1868 Jan. 14; elected pres. of the United States as a republican 1868; and was re-elected 1872. At the close of his second term he set out on a tour of the world, leaving Philadelphia 1877, May 17, and returning to San Francisco 1879, Sep. 20. During this trip he was the recipient of the most distinguished honors from the royal and imperial families of the old world. In 1880 he extended his pleasure trip to Cuba and Mexico. At the national republican convention in Chicago 1880, June, his name was presented as candidate for a third presidential term, and under the leadership of Roscoe Conkling (q.v.) the delegates gave him 302—313 votes on 36 successive ballots, but ultimately nominated Gen. James A. Garfield. In 1881 he made his permanent winter residence in New York, retaining his cottage at Long Branch for summer use; 1882 was appointed a commissioner to negotiate a commercial treaty with Mexico, and became interested in the railroad development of that country; 1884 was bankrupted by the failure of the firm of Grant and Ward, in whose banking business he had invested all his capital, leaving the management of the business entirely to Ferdinand Ward; and in the summer of the same year a cancer appeared at the root of his tongue. He raised money by the sacrifice of his war swords, uniforms, testimonial swords, plate, rich caskets, and other articles presented him while on his trip round the world, and then, with failing strength, heroically began writing his memoirs to provide means of supporting his family. On 1885, Mar. 4, congress passed a bill placing him on the retired list of the army with the rank and pay of general. In June following he

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was removed to Mt. McGregor, near Saratoga, N. Y., where he continued work on his memoirs, while his strength rapidly failed. He finished the proof-reading of his book four days before his death, and was conscious to the last. Imposing funeral ceremonies were held in New York Aug. 8, and the remains were placed in a temporary tomb erected in Riverside Park, overlooking the Hudson river. He wrote *An Undeserved Stigma* (as an act of justice to Gen. Fitz John Porter) in the *North American Review* (1882, Dec.), and *Personal Memoirs of U. S. Grant*, 2 vols. (New York 1885-6). He was a man of simple habits, great force of character, determined will, and great pertinacity; remorseless in war, most magnanimous in peace; exceedingly modest and unassuming, and of singular purity of character.

The remains of Gen. G. now rest in a splendid granite mausoleum, reared by private subscription at a cost of \$600,000, near the spot of his first entombment, the body being sealed in a sarcophagus of red porphyry. The formal presentation of the mausoleum to the city of New York, 1897, Apr. 27, was the occasion of an unprecedented ceremonial, more than half a million visitors being in the city. The summit of the structure is 150 ft. above the ground. The crypt consists of an open circular passage set off by massive square pillars from a central space within which, on a raised square granite platform, stands the sarcophagus.

GRANT'A: see CAM.

GRANTHAM, *grănt'am*: municipal and parliamentary borough and market-town of England, county of Lincoln, on the left bank of the Witham 23 m. s.s.w. of the city of Lincoln, about 110 m. n.n.w. of London. G. has a free grammar-school, with income from endowment of £800 a year. The parish church, a beautiful structure of the 13th c., has a fine spire 273 ft. high. Here Newton was instructed in classics before entering Cambridge. A canal 30 m. long communicates with the river Trent. The trade is chiefly in malt, corn, and coal. G. returns one member to parliament. Pop. of parl. bor. (1871) 13,250; (1881) 17,235; (1891) 16,746.

GRANULAR, GRANULATE, GRANULATION, GRANULE, GRANULOSE, GRANULOUS, etc.: see under GRAIN 1.

GRANULATION [see GRAIN 1]: material of new texture as first formed in a wound or on an ulcerated surface: see INFLAMMATION: CICATRIZATION: WOUNDS: ULCER.

GRANVILLE, *grăng-vêl'*: fortified town and seaport of France, department of La Manche, on a promontory surmounted by a fort, 23 m. n.e. of St. Malo. It is a badly built and uninteresting town; the extensive new pier, built with strength to admit of its being mounted with cannon, and the old parish church of gray granite, being almost the only noteworthy features. Its roomy harbor, is well sheltered, but dry at low water. The principal trade of G. is in whale, cod, and oyster fisheries. Pop. (1891) 12,721.

GRANVILLE—GRAPE-SHOT.

GRANVILLE, *grăn'vîl*, The Right Honorable GRANVILLE GEORGE LEVESON-GOWER, Earl, K.G., D.C.L., F.R.S.: b. London, 1815, May 11; eldest son of the first Earl G. He was educated at Eton and Christ Church, Oxford, where he took his degree 1834, entered political life as attaché to the British embassy at Paris 1835, was elected M.P. 1836, 7, became under-sec. of state for foreign affairs 1840, succeeded to the peerage 1846, was appointed vice pres. of the board of trade 1848, entered the cabinet 1851, and Dec. succeeded Lord Palmerston in the foreign office, retiring early in 1852. He then became paymaster gen. of the forces, chancellor of the duchy of Lancaster, treas. of the navy, vice-pres. of the royal commission for the great exhibition 1850, pres. of the council 1853, ministerial leader in the house of lords 1855, pres. of the council 1859-66, chairman of the great exhibition commission 1862, and lord warden of the Cinque Ports 1865. He was colonial sec. under Gladstone 1868-70, and sec. for foreign affairs 1870-74, again became sec. for foreign affairs under Gladstone 1880, and was his sec. of state for the colonies 1886. He d. 1891, Mar. 31.

GRAPE, n. *grâp* [F. *grappe*; It. *grappo*, a grappling or clutching, a cluster or bunch of grapes: It. *grappa*, the stalk of fruit: Gael. *grâp*; Ir. *grapain*, to climb or clamber as the vine—*lit.*, the fruit-bearing plant which clambers]: the fruit of the vine; a single berry (see VINE). **GRA'PY**, a. -*pî*, like grapes, or made of grapes; full of clusters of grapes. **GRAPELESS**, a. without grapes. **GRAPE-SHOT**, see below. **GRAPESTONE**, n. the seed of the grape. **GRAPE-SUGAR**, a variety of sugar obtained principally from fruits, forming also the basis of honey, and often called *sugar of fruits*, *sugar of starch*, or *glucose* (see SUGAR: GLUCOSE). **GRAPERY**, n. *grû'për-î*, a place where grapes are grown: see VINE. **GRAPE-FRUIT**, the Shaddock (q.v.).

GRAPE-HYACINTH (*Muscári*): genus of bulbous-rooted plants, of nat. ord. *Liliaceæ*, nearly allied to the hyacinths, but differing in the globose or subcylindrical perianth, contracted at the mouth, and 6-toothed. The species are natives chiefly of countries near the Mediterranean, and warmer temperate parts of Asia. Some of them are frequent in flower-borders in more northern countries. *M. moschatum* has a smell of musk. The flowers of the G. H. mostly are blue.

GRAPE-SHOT, or **TIER-SHOT**: shot fired in clusters; bullets or small iron balls piled round an iron pin which holds together a series of parallel iron plates (each the diameter of the cannon used), between which plates are the shot, kept in their places by holes in the plates. Small 3½-inch or 4-inch shells are also quilted together like grape for firing from mortars at short range, e.g. in clearing the covert-way of a fortress from the third parallel. In either case, the explosion of the charge bursts asunder the binding, and the shot (or shells) begin to scatter directly on leaving the muzzle of the piece. G. S. are very formidable against dense masses of troops, but only at compara-

GRAPHIC—GRAPHOTYPE.

tively short range. The shot employed differ in weight from 6 oz. to 4 lbs., according to the calibre of the gun from which they are fired.

GRAPHIC, a. *grăf'ík*, or GRAPHICAL, a. *-î-kāl* [Gr. *graphō*, I write: Gr. *graphikōs*; L. *graphicus*, done to the life: F. *graphique*, graphic]: well delineated; described with accuracy; lifelike; having the appearance of writing, as *graphic granite*. GRAPHICALLY, ad. *-lî*.

GRAPHIS [Gr. *graphō*, I write]: genus of lichens, which gives its name to a tribe, *Graphideæ*, remarkable for the resemblance which the fructification (*apothecia*, or *shields*) assumes to the forms of the letters of oriental alphabets. Hence, some of these little plants have received such names as *Scripture-wort*. As some of the *Graphideæ* are found only on the bark of particular species of *Cinchona*, they guide to the identification of very valuable barks.

GRAPHITE, n. *grăf'it* [Gr. *graphō*, I write]: a mineral, a form of the element carbon, known chiefly by the name *plumbago* or *black-lead*, though lead does not at all enter into its composition, used in the manufacture of pencils (see BLACK LEAD). GRAPHOLITE, n. *-ô-lit* [Gr. *lithos*, a stone]: a sort of slate suitable for writing on.

GRAPHOMETER, n. *grăf-ôm'ê-têr* [Gr. *graphō*, I write; *metron*, a measure]: mathematical instrument for measuring angles, called also a *semicircle*; properly called PROTRACTOR (q.v.). GRAPHOMETRICAL, a. *-mêt'rî-kāl*, pertaining to or ascertained by a graphometer.

GRAPHOPHONE, *grăf-o-fôn*: apparatus for reproducing speech; invented by Charles Sumner Tainter, 1886. It is constructed on the same general plan as the phonograph, (q.v.).

GRAPHOTYPE, n. *grăf'ô-tip* [Gr. *graphō*, I write; *tupos*, a type]: one among numerous modes of producing an engraved picture-surface from which printing can be effected by the ordinary press; intended as a cheap substitute for engraved wood-blocks in illustrations for books. The principle is, sketching the design on a chalky surface, and brushing away the chalk from between the lines. In later forms of the process, invented 1860 by an American wood engraver DeW. C. Hitchcock, the block is superseded by a zinc plate covered with finely-pounded French chalk, brought to a hard and very fine texture by enormous pressure, with a glossy surface produced by an interposed steel plate. On this white surface, sized and dried, the picture is drawn with camel or sable hair pencils, dipped in an ink made of glue and lampblack. When dry, the white or uninked portions are rubbed down by means of a small fitch-hair brush, and pads covered with silk velvet. The rubbing is continued until the white is sunk sufficiently below the level of the inked picture or design. The plate is then saturated with liquid glass or silicate of soda, which converts the French chalk into a kind of marble. An electrotype of this is then taken to be printed from.

GRAPNEL—GRASLITZ.

GRAPNEL, n. *grăp'něl* [F. *grappin*; OF. *grappil*, the grapple of a ship—from *grappe*, a hook]: small anchor with four or five flukes or claws, used to hold boats or small vessels; a grappling-iron; also **GRAP'LINE**, or **GRAP'LING**, n.: see **GRAPPLING-IRON**.

GRAPPLE, v. *grăp'pl* [OF. *grappil*, the grapple of a ship: It. *grappare*, to clutch, to grapple: Sw. *grabba*, to grasp: Dut. *grabbelen*, to seize greedily]: to seize; to lay fast hold of; to contend in close fight, as wrestlers: N. a seizing firmly; a wrestler's hold; a close fight; an iron instrument by which one ship fastens on another. **GRAPPLING**, imp. *grăp'pling*: **ADJ.** catching as a grapple. **GRAPPLED**, pp. *grăp'pld*. **TO GRAPPLE WITH**, to contend with; to struggle against boldly. **GRAPPLING-IRONS**, small grapnels used in sea-battles.

GRAP'PLE-PLANT (*Uncaria procumbens*): procumbent plant of the same genus with the gambir (q.v.), native of s. Africa. The seed-vessel has many hooked thorns, and clings most tenaciously to any animal—a provision for the distribution of the seed. When it lays hold of the mouth of an ox, Livingstone says, the animal stands and roars with pain and a sense of helplessness.

GRAPPLING-IRON, or **GRAP'NEL**: sort of small anchor, having several pointed claws, used generally in making fast boats and other small vessels. A similiar instrument of more formidable dimensions is employed in naval battle for grappling the rigging of a hostile ship to hold it fast, preparatory to boarding.

GRAPTOLITES, n. plu. *grăp'tō-līts* [Gr. *graptos*, written; *lithos*, a stone]: in *geol.*, fossil zoophytes probably akin to the sertularians of modern seas, found throughout the Silurian deposits; also **GRAP'TOLITH'US**, n. *-tō-lith'ūs*. **GRAP'TOLITIDÆ**, n. plu. *-līt'ī-dē*, an extinct sub-class of the Hydrozoa.

GRAP'TOLITES: group of fossil zoophytes, apparently nearly related to the recent sertularia. They had simple or branched polypidoms, formed of a horny substance. The cells in which the polyp lived were arranged in a single series on one side of the rachis, or in a double series on both sides; the rachis was generally prolonged beyond the cells at the growing end of the polypidom. Egg capsules have been observed attached to the polypidom, exhibiting a method of reproduction similiar to that in the hydroid zoophytes. The generic division of the graptolites has been based on the arrangement of the cells. Nearly 80 species have been described; confined to the Silurian strata, and most abundant in the hard slaty shales, which were the fine mud of the Silurian seas.

GRAPY: see **GRAPE**.

GRASLITZ, or **GRASSLITZ**, *grăs'līts*: small town of Bohemia, on the border of Saxony, 20 m. n.n.e. of the town of Eger. It has manufactures of cotton-goods, paper, looking-glasses, musical and mathematical instruments, and machinery. It has a handsome church, built

GRASMERE—GRASSE.

1618: and is the headquarters of a military district. Pop. (1880) 7,609; (1890) 9,929.

GRASMERE, *gräs'mēr*: village and lake in Westmoreland, England, about three m. n.w. of Ambleside. The village, beautifully situated at the head of the lake, has an ancient church, containing Wordsworth's grave, which is marked by a plain and modestly-fashioned slab. The lake is more than a mile long, and about half a mile broad, is oval in form, and incloses a small island. It is girdled about by high mountains, and forms one of the most beautiful scenes in England. Pop. about 600.

GRASP, n. *gräsp* [Ger. *grappsen*, to grope: It. *graspere*, to grasp: Pol. *grabki*, a fork: connected with GRIPE and GRAB]: the grip or seizure of the hand; hold or possession; power of seizing: V. to grip or seize the hand; to catch at; to lay hold of greedily; to encroach. GRASP'ING, imp.: ADJ. covetous; rapacious: N. seizure; attempt to seize. GRASPED, pp. *gräsp't*. GRASP'ER, n. one who. GRASP-ABLE, a. -*ä-bl*, capable of being grasped. GRASP'INGLY, ad. -*li*. To GRASP AT, to try to seize; to catch at.

GRASS, n. *gräs* [AS. *græs*; Dut. *gras*, grass: Norw. *gras*, applied to every green herb: Dut. *groese*, growth: prob. from same root as Lat. *creasco*, Eng. *grow*]: field or hill pasture; herbage; the plants having simple leaves, jointed and tubular stems, etc. (see GRASSES): V. to cover with turf or herbage. GRAS'SING, imp. GRASSED, pp. *gräst*. GRAS'SY, a. -*si*, covered with grass; green with grass. GRAS-SINESS, n. GRASS'LESS, a. wanting grass. GRASS-GREEN, green like grass. GRASS-GROWN, grown over with grass. GRASS PLOT, level spot covered with grass. GRASS-WIDOW, in *familiar slang*, a wife whose husband is compelled by his duties to live abroad for a long time, and away from her, as an Indian officer; a woman living apart from her husband; a woman from whom her husband has run away, and she knows not whether he be alive or dead. GONE TO GRASS, *colloq.* dead.

GRASS CLOTH: popular though erroneous name of certain beautiful fabrics manufactured in the East from different kinds of fibres, none of which are produced by grasses. One of these fabrics is made from the fibre of *Behmeria nivea*, popularly called China-grass; another known as *pina muslin*, from the fibre of *Bromelia Pigna*. See BÖHMERIA and BROMELIACEÆ.—The kinds of cloth really made from the fibre of grasses are extremely coarse.

GRASSE, *gräs*: manufacturing town of France, dept of Alpes-Maritimes, in the midst of flower-gardens, on the s. slope of a hill, 23 m. e.n.e. of Draguignan. The streets are steep, narrow, and crooked, but the houses are well built. The principal buildings are the college, hospital, and ecclesiastical school. G. is second only to Paris in its manufactures of essences and perfumes, made from the roses, orange-flowers, heliotropes, mint, etc., which, from the mildness of the climate, are successfully grown in the vicinity. It has also manufactures of woolen goods, soap, leather, and olive oil; several silk-spinning factories and

GRASSE—GRASSES.

tanneries; and considerable trade in oranges, citrons, wax, and honey. Pop. (1896) 15,020.

GRASSE, *grás*: FRANÇOIS JOSEPH PAUL DE, Count, and Marquis de Grasse-Tilly: 1723-1788, Jan. 11; b. Provence, France: admiral. He entered the navy at an early age, served against the Moors and Turks, and was promoted lieut. 1751, capt. 1762, rear-admiral 1778, and chief of squadron 1779. In 1781 he was appointed commander of a fleet fitted out by France to aid the Americans in the war with England, and sailed Apr. 13 with 29 ships and 3,000 troops. He eluded the British fleet, blockaded the York and James rivers, took part in the siege and capture of Yorktown, and with Rochambeau received the special thanks of congress. After the war he re-established the naval power of France in the W. Indies, and was defeated by the English Admiral Rodney at St. Dominique 1782, Apr. 12.

GRASSES (*Gramineæ* or *Graminaceæ*): natural order of endogenous plants, containing almost 4,000 known species, about one-twentieth of all known phanerogamous plants; while the *social* habit of many of them, and the vast number of individual plants within even a limited tract, give them a still greater proportion to the whole phanerogamous vegetation of the earth. They are distributed over all parts of the world; some are characteristic of the warmest tropical regions, and some of the vicinity of perpetual snow; but they bound most of all, and particularly in their social character clothing the ground with verdure and forming the chief vegetation of meadows and

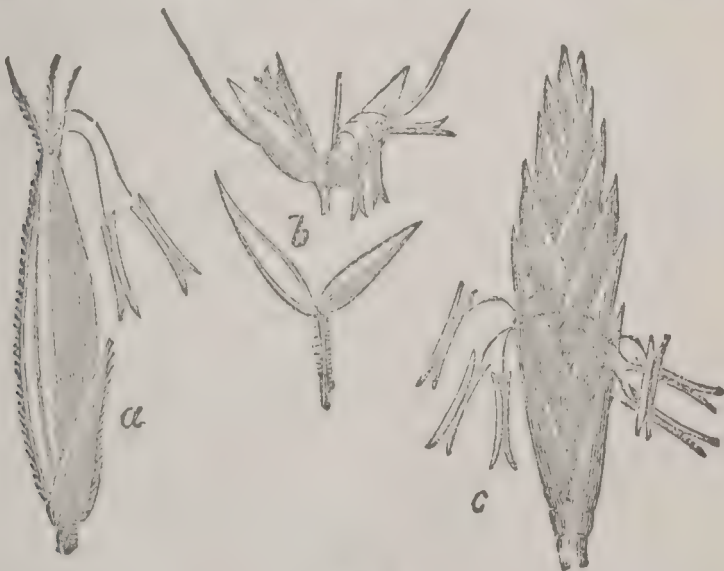


Fig. 1.

a, spikelet with one flower; two anthers; *b*, spikelet with two flowers, shown detached from the glumes; three anthers; *c*, spikelet with many florets; three anthers;

pastures, in the northern temperate zone. There is no kind of soil which is not suitable to some or other of the G.; and while some are peculiar to dry and sterile soils, others are found only on rich soils with abundant moisture; some grow in marshes, stagnant waters, or slow streams, some only on the sea-coast; none are

GRASSES.

truly marine. Some G. are annual, and some perennial; They have fibrous roots; the root-stock often throws out runners; the stems (*culms*) are round, jointed, generally hollow, except at the joints, rarely filled with pith, generally annual, and of humble growth, but sometimes perennial and woody, occasionally—as in bamboos—attaining the height and magnitude of trees. The leaves are long and narrow, alternate, and at the base sheath the culm; the sheath is split on the side opposite to that from which the blade springs; and at the junction of the blade and sheath, there is often a short membranous prolongation of the epidermis of the sheath, called the *ligule*. The flowers are generally hermaphrodite, but sometimes unisexual, and more frequently so in the G. of tropical than of colder climates; they are disposed in *spikelets*, and these again generally in spikes, racemes, or panicles; they have no proper calyx nor corolla, but consist of the parts of fructification inclosed in two series of small bracts, some or all of which are sometimes awned: see *AWN*. The two outer bracts of each spikelet are called *glumes*. In some G. only one glume is properly developed for each spikelet. Within the glumes are the *florets* forming the spikelet, sometimes only one, but often a larger number, each floret having generally two small bracts called *paleæ* or *glumellæ*, the immediate covering of the parts of fructification. The glumes were called the calyx by the older botanists, and the paleæ the corolla, but inaccurately. The stamens are hypogynous, sometimes only one, sometimes six or more, but very generally three, the anthers attached to the filaments by the middle of their back, and easily moved by the slightest breeze. The ovary is simple, one-celled; the styles two or three, sometimes united; the stigmas feathery or hairy. The fruit is a *caryopsis*, the pericarp being incorporated with the seed; the seed consists of a small embryo, lying at the base and on the outside of a large farinaceous albumen, from which arises in great part the extreme importance of this order of plants to man; the farinaceous seeds of some of the G. being the corn or grain which forms a chief part of human food. For the G. cultivated on

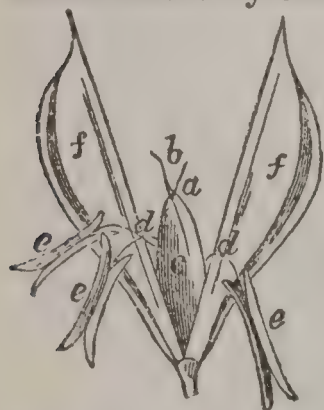


Fig. 2.—Spikelet with one floret; three anthers:

a, the floret; *b*, stigmas; *c*, ovule; *d*, filaments; *e*, anthers; *f*, glumes.

this account, see *CEREALIA*; also the respective titles. Starch is the principal substance entering into the composition of these farinaceous seeds, and is often extracted from them, either to be used by itself as an article of food, or for other economical purposes, according to the kind. Besides starch, they contain, in greater or less proportions, gluten and other similar substances, on which not a little of their nutritive value depends. For peculiarities of composition of the most important grains, see *BREAD*, or under their respective titles. When, by the process of *malting* (see *BEER*), great part of

the starch of the grain has been converted into sugar, a fermented liquor is made from it, of which beer or ale made from barley is the most familiar example; and from this, again, a spirituous liquor—as whisky—is obtained by distillation. Fermented and spirituous liquors are commonly made from different kinds of grain in different parts of the world, particularly, barley, maize, rice, and millet.—SUGAR is another important product of grasses, existing in large quantity in the stems of many species, and particularly abounding in the soft internal part of some, as sugar-cane, maize, and shaloo or sugar-grass (*Sorghum saccharatum*, see DURRA), from which it is extracted for use. The sugar-cane yields far more sugar than all the other plants cultivated on that account in the world. Rum—obtained by fermentation and distillation from sugar—is another well-known product of the sugar-cane, and similar liquors may be obtained from the other sugar-producing G. —Besides these uses, G. are of great importance as affording pasture and fodder (*hay* and *straw*) for cattle: see FODDER.—The woody stems of the larger G. are applied to a great variety of economical purposes: see BAMBOO. Those of some of the smaller G. are much used in some countries for thatch, and are also made by plaiting into straw-hats, ladies' bonnets, etc.: see STRAW-MANUFACTURERS.—The underground runners of some species, as the marrum grass and sea lyme-grass, make them particularly useful for binding and fixing loose sands.—The stems and leaves of many G. have fibres of such length and strength that they are twisted into coarse ropes for many purposes in which no great durability is required. Thus, hay and straw ropes are frequently used on farms, and different grass fibres are similarly used in many countries. Some G., as the moonja (*Saccharum Munja*) of India, are not simply twisted into ropes, but their fibres are first separated by moistening and beating: and the fibres of some, as the esparto (q.v.) of Spain, are made not only into ropes, but into mats, sacks, and other very coarse fabrics.—The Chinese make paper from the young shoots of bamboo; paper is made also from the straw of rye, wheat, barley, and oats, and might be made from that of many G.: see PAPER.—The perennial roots and runners of some G. contain peculiar substances, on account of which they are used medicinally, e.g. those of couch-grass. The stems and leaves of some contain coumarine (q.v.), and have a very agreeable fragrance when dried, as in the case of the sweet-scented vernal grass (*Anthoxanthum odoratum*). A few, chiefly E. Indian species, contain other aromatic and fragrant substances in the stem and root, particularly lemon grass, vittievayr, and other species of *andropogon*, which yield grass-oil (q.v.).—It has been alleged that the seeds of a few G. are poisonous, but this lacks confirmation, though darnel (q.v.) in particular has a bad reputation.—The stems, leaves, and glumes of G. contain a large proportion of silica, particularly in the epidermis, so that when large quantities are burned, a sort of glass is formed; a fact which requires attention in questions relative to the

GRASSHOPPER.

manures proper for particular crops, and the most profitable alternation of crops in husbandry. The following are the tribes into which botanists have divided the nat ord, of G., with the names of some of the most important, as examples :

<i>Oryzææ</i>	Rice.
<i>Phalareææ.</i>	Maize; Job's Tears (<i>Coia</i>); Canary Grass; Foxtail Grass; Soft Grass; Timothy Grass.
<i>Panicææ.</i>	Millet (of various kinds); Fundi; Guinea Grass.
<i>Stipeæ</i>	Feather Grass; Esparto.
<i>Agrostææ.</i>	Bent Grass.
<i>Arundææ.</i>	Reeds; Marrum Grass; Pampas Grass.
<i>Pappophoreæ</i>	
<i>Chlorææ.</i>	Cord Grass (<i>Spartina</i>); <i>Cynodon</i> ; <i>Eleusine</i> .
<i>Avenææ.</i>	Oats; Vernal Grass; <i>Aira</i>
<i>Festuceæ.</i>	Fescue; Meadow Grass; Manna Grass; Teff; Cock's-foot Grass; Tussac Grass; Dog's-tail Grass.
	Sub-tribe <i>Bambusidæ</i> —Bamboos.
<i>Hordeæ.</i>	Wheat; Barley; Rye; Spelt; Rye-grass; Lyme Grass.
<i>Rottbelleæ.</i>	Gama Grass.
<i>Andropogoneæ.</i>	Sugar-cane; Shaloo or Sugar Grass; Durra; Lemon Grass; Vittievayr.

Among farmers, the term G. is extended to include with the true G. other plants cultivated for fodder and forage, such as clover, etc., and these are distinguished by the term *artificial grasses*, while the true G. are called *natural grasses*.

GRASS'HOPPER: English name of many species of insects, forming a family of the ord. *Orthoptera*, section *Saltatoria*, called *Gryllidæ* by some (chiefly English) entomologists, and *Locustidæ* by others—those who adopt the former name designating the crickets (q.v.) *Achetidæ*. Locusts (q.v.), however, do not belong to this family, though very closely allied, but are distinguished from it by greater robustness of frame, shorter legs, and shorter antennæ. The antennæ of the grasshoppers are long and threadlike, as in the crickets. The wings of grasshoppers, as of locusts, fold together like the sides of a roof, while those of crickets are horizontal when at rest. Grasshoppers, like crickets and locusts, have the thighs of the



Grasshopper, Female (*Gryllus viridissimus*).

hinder legs very large and adapted for leaping. But grasshoppers do not leap with so great energy as locusts, nor are they capable of so sustained a flight. They are, indeed, some of the family in which the wings are merely

GRASS-MOTH—GRASS OIL.

rudimental, and the elytræ or wing-covers of small size. Most of them, however, have well-developed wings; and the wing-covers of the males, as in crickets, have a spot at the base of a talc-like appearance, by the rubbing together of which that chirping sound is produced which is probably connected with the sexual instincts of the insects, but which we have learned to associate with bright green pastures and sunshiny days. Grasshoppers are herbivorous. They are numerous in most parts of the world. A large species is the GREAT GREEN G. (*Gryllus viridissimus*, known also as *Locusta viridissima* and *Acrida viridissima*), about two inches in length, and of a fine green color. A green color prevails among the grasshoppers of temperate climates, enabling them more readily to elude observation among the herbage in midst of which they live; but some tropical species are richly colored, and some have very large wings, almost like those of lepidopterous insects. The greater number of G. feed on grass and the leaves of herbaceous plants. Experiments have been made to utilize the American G. as an article of food.

GRASS'-MOTH (*Crambus*): genus of small moths, allied to the clothes-moths, of which the species are numerous, inhabiting pastures, where they are often seen to rise in great numbers when disturbed; and soon to settle again on the blades of grass. Their form, when their wings are closed, is long and narrow, pointed at the head, abruptly cut off at the opposite end. They are often brown and white, sometimes silvery and golden.

GRASS OF PARNASSUS (*Parnassia*): genus of plants, generally regarded as belonging to the nat. ord. *Droseraceæ*, but referred by Lindley to *Hypericaceæ*. The calyx is deeply 5-cleft, there are 5 petals, 5 stamens; and 5 scales fringed with globular-headed threads alternate with the stamens, which are regarded by Lindley as bundles of altered stamens; there are four stigmas, and the fruit is a 1-celled, 4 valved capsule with many seeds. The genus consists of a few small herbaceous plants, with flowers of considerable beauty, growing in wet situations in the colder northern parts of the world. Some are found within the Arctic circle, and to the snow-line of the Alps, Himalaya, and other mountains. The common grass of parnassus (*P. palustris*) is an ornament of bogs and wet places in various parts of Europe, with heart-shaped leaves, mostly radical and on long foot-stalks, and one sessile leaf on the stem, which is about eight or ten inches high, and bears in autumn a solitary yellowish-white flower. It is called *Agrostis en to Parnasso* by Dioscorides, whence its modern name.

GRASS OIL: fragrant volatile oil obtained from the leaves and stems of certain grasses of the genus *Andropogon* (see LEMON GRASS), natives of India. The kind known as *grass-oil of Nemaour* is produced at the foot of the Vindhya Hills, and is exported from Bombay. It has been ascribed to the grass called vittievayr or cuscus (*A. muricatus*); to another species, which Dr. Royle supposes

GRASS TREE.

to be the *Calamus aromaticus* of the ancients; and to a third, like these, a very fragrant grass (*A. Iwarancusa*). Probably it may be obtained from more than one species. It is obtained by distillation; the grass, being cut when it begins to flower, is bound in small bundles, which are thrown into a boiler with water, and the oil, as it distils over, is received in cold water, from which it is afterward skimmed. It is of light straw color, has a peculiar rich agreeable odor, and is very pungent and stimulating. It is used in medicine, as a stimulant and diaphoretic but more frequently as a liniment in chronic rheumatism. Its chief use, however, is in perfumery. It is sometimes called *ginger-grass oil*, but commonly *oil of geranium* by perfumers, and by druggists *oil of spikenard*.—Similar to this, though differing, and obtained from other species of the same genus, is the oil known as oil of lemon grass.—See CITRONELLA.

GRASS' TREE (*Xanthorrhæx*): genus of plants of nat. ord. *Liliaceæ*, natives of Australia, constituting a peculiar feature in the vegetation of that part of the world. They have shrubby stems, with tufts of long wiry foliage at the summit, somewhat resembling small palms; a long cylin-



Grass Tree (*Xanthorrhæa hastilis*).

drical spike of densely aggregated flowers shooting up from the centre of the tuft of leaves. The base of the inner leaves of some species is eatable, and forms, particularly when roasted, an agreeable food. It has a balsamic taste; and all the species abound in a resinous juice, which, on exposure to the air, hardens into a reddish-yellow inodorous substance with a shining fracture, soluble in alcohol, and useful as a tonic in dysentery, diarrhea, and other intestinal maladies; used also by the natives of Australia for uniting the edges of wounds, and with an aluminous earth for caulking their canoes, and as a cement for vari-

GRASSUM—GRATE.

ous purposes. The common grass tree (*X. hastilis*) has a stem about 4 ft. high, but sometimes a foot in diameter. It is of very slow growth, and is supposed to be many centuries old when it has reached such dimensions.—Several species are found in e. Australia, where their leaves are used as fodder for all kinds of cattle.

GRASSUM, n. *grás'üm*, or GERSOME, n. *ger'süm* [mid. L. *gersümā*, a fine or extra sum paid for possession: AS. *gersume*; Icel. *görsemi*, a treasure]: in the law of Scotland, a lump sum paid by persons who take a lease of landed property; a sum paid by a tenant to his landlord at the entry to a lease over and above the rent payable that year, or by a new heir to a lease or feu to a superior, usually double the feu-duty or rent payable that year; a compensation.

GRASS VALLEY: a city in Nevada co., Cal.: 4 m. s.w. of Nevada, 17 m. n. of Colfax, 48 m. n.n.e. of Sacramento. It is the seat of a Rom. Cath. bp., and contains a Rom. Cath. convent and 2 orphanages, 6 churches, high, intermediate, and preparatory public schools, 1 national bank, 1 daily newspaper, 2 iron foundries, several quartz mills. It is the centre of the richest gold quartz-mining region in the state. Pop. (1900) tp. and city 7,043.

GRASS'WRACK (*Zostera*): genus of plants of nat. ord. *Naiades*, one of the few genera of phanerogamous plants which grow among seaweeds at the bottom of the sea. The leaves are narrow and grass-like; and the flowers consist merely of stamens and pistils, without any perianth, inserted on the central nerve of one side of a flat thin linear *spadix*, with a leafy *spathe*. The pollen is confervoid.—The common G. (*Z. marina*) is a perennial plant, which forms green meadows on the sandy bottom of shallow parts of many seas, and abounds in creeks and salt-water ditches. It becomes white by exposure to the air. The rush-like coverings of Italian liquor-flasks are made of it, and it is much used for packing glass bottles and other brittle ware. It has been long used in Holland, Gothland, and Iceland for stuffing pillows and mattresses, and this use has of late years much extended, so that the plant has become an article of commerce, under the name of *Alga marina*, or more usually, but incorrectly, *Alva marina* (Ger. *See-gras*).

GRAT, v. *grät* [pt. of Scotch *greet*, to cry, to shed tears]: cried; shed tears.

GRATE, n. *grät* [L. *crātēs*; It. *grata*, a grate, a hurdle: Pol. *krata*, a grate, a lattice]: a framework of iron bars for holding the fuel in a fireplace; a partition or frame made of bars. GRA'TING, n. the iron framework over a window, a cellar entrance, and the like.

GRATE, v. *grät* [OF. *grater*; F. *gratter*, to scratch, to scrape: It. *grattare*, to scratch, to rub—from mid. L. *crātārē*: Ger. *kratzen*, to scratch: Icel. *grata*; Scot. *greet*, to weep—from the high pitch of a voice loudly weeping producing the disagreeable sensation]: to rub one body against another so as to produce a harsh sound; to wear away into

GRATE—GRATEFUL.

small particles by rubbing against anything rough; to act or utter so as to offend; to irritate. GRA'TING, imp.: **ADJ.** rubbing; causing a sense of harsh rubbing or rasping; offensive; disagreeable: **N.** a harsh sound or rubbing. GRA'TED, pp. rubbed harshly; worn off by rubbing. GRATER, n. *grā'tēr*, a kind of kitchen rasp; any rough instrument to grate with. GRA'TINGLY, ad. *-lī*, harshly.

GRATE: iron cage holding the coal for a fire. Considerable improvements have been made of late years in the construction of common domestic grates. Our forefathers simply added an iron cage to the old form of fireplace built originally for burning a pile of wood. This was a large square-sided recess, with a very wide opening for the chimney. Count Rumford pointed out the disadvantages of this, and the principles upon which they should be remedied: see CHIMNEY. In the modern G., the filling up of the square cavity recommended by Count Rumford, and also his plan of lowering and narrowing the throat of the chimney, are often effected by iron plates forming part of the grate. These plates are readily heated, and with equal readiness radiate and reflect the heat into the room, and thereby effect a considerable saving of coal, besides which the G. itself is brought forward level with, or even projecting beyond, the walls of the room, whereby the radiation from the heated coal is utilized to the utmost. One of the most effective as well as elegant forms of G. is that which consists simply of a large square iron plate set nearly flush with the wall, in the middle of which is a hemispherical cavity with bowed bars in front, and a trapped opening into the chimney in the upper part of this cavity. When there is sufficient draught, this form of G. gives a good fire, and effects the maximum economy of fuel for an open fireplace (always somewhat wasteful though more healthful, compared with a stove). The curved surface behind and above the fire radiates and reflects into the room from every part of its surface, and the plate flush with the wall, which is heated by conduction, may be regarded as a part of the room, and thus the main condition economy is effected, viz., throwing as much as possible of the heat into the room, and allowing as little as possible to go up the chimney. A lining of firebrick or of fireclay, molded to the form of the back of the grate, is useful in retaining the heat necessary for complete combustion of coal; the firebrick, being a bad conductor and an excellent radiator, becomes red-hot on its surface next to the coal, and this heat is not carried away, but is radiated into the fire, and assists in burning the carbon of the smoke. For the conditions for securing an effective draught, see CHIMNEY.

GRATEFUL, a. *grāt'fûl* [L. *gratus*, pleasing, agreeable: It. *grato*]: having a due sense of benefits or kindness; agreeable; affording pleasure to the senses. **GRATE'FULLY**, ad. *-lī*. **GRATE'FULNESS**, n. **GRATIFY**, v. *grāt'î-fî* [OF. *gratifier*, to gratify—from L. *gratificārē*]: to give pleasure to; to delight; to please. **GRAT'IFYING**, imp.: **ADJ.** giving

GRATIAN—GRATIANUS.

pleasure. GRATIFIED, pp. *-fīd*. GRATIFIER, n. *-ér*, one who. GRATIFICATION, n. *-fī-kā'shūn* [F.—L.]: the act of pleasing the mind, taste, or appetite; that which affords pleasure or delight. GRATITUDE, n. *-tūd* [F.—from L. *gratitūdinem*]: a desire to return benefits received; a sentiment of good-will toward a benefactor; gratefulness.—SYN. of 'grateful': pleasing; gratifying; welcome; delightful; delicious; thankful; acceptable;—of 'gratify': to humor; indulge; satisfy; satiate; glut; cloy; requite; recompense; soothe.

GRATIAN, *grā'shī-an* (FRANCISCUS GRATIANUS): b. abt. the end of the 11th c.; native of Chiusi, in Tuscany: compiler of the well-known body of canon law commonly cited under the title *Decretum Gratiani*. It is remarkable, however, that though few authorities have been so frequently cited, or have obtained so wide and permanent acceptance as this celebrated collection, hardly anything is known of the collector's personal history, except that he became, in later life, a Benedictine monk of the monastery of St. Felix in Bologna. The date commonly assigned to G.'s collection is 1141-50; its title, however, *Decretum*, or *Concordia Discordantium Canon*, is believed to be of later origin. How far the collection is the work of G. himself, or how far he was indebted for his materials, and even for their arrangement, to earlier collectors, is not known. The work comprises not only the decrees of councils and popes down to Innocent II. (including the spurious ISIDORIAN DECRETALS, q.v.), but also passages from the Scripture, from the Fathers, and even from the Roman law. It is divided into three parts. The first regards the hierarchical constitution of the church, and relates chiefly to doctrinal and moral subjects. It is divided into 'distinctions.' The second treats of external jurisdiction, under the head of 'causes' and 'questions.' The third regards the inner life of the church—the liturgy and the sacraments. From his adoption of the Isidorian decretals, it may be inferred that G.'s authority as a critic is of little value; and, in general, no authority is given to any document beyond what it intrinsically possesses, from the fact of its being placed in G.'s collection. For the other collectors of the canon law, see CANON LAW.

GRATIANUS, *grā-shī-ā'nūs*, AUGUSTUS, Roman Emperor: 359, Apr. 19—353, Aug. 25 (reigned 375-383); b. at Sirmium, Pannonia; eldest son of Valentinian I. (see VALENTINIANUS I.) by his wife Severa. While he was still *nobilissimus puer* (heir-apparent), he was created consul, and in 367, was elevated by his father to the rank of Augustus at Ambiani (Amiens) in Gaul. In the following year, he accompanied his father in his expedition against the Alemanni. On the death of Valentinian, the troops elevated G. to the throne, giving him at the same time as a colleague his half brother Valentinian II. Gaul, Spain, and Britain fell to G.'s share; and as his brother was only four years old, G. is supposed by many authorities to have been the monarch *de facto* of the rest of the Western

GRATICULATION—GRATIOLA.

Empire, fixing his residence at Treviri (now *Treves*). During the first part of his reign, a fierce warfare was carried on against the tribes who possessed the Danubian provinces and Illyricum; and he was on the point of marching into Thrace, to assist his uncle Valens against the Goths, when he was suddenly called to defend his dominions against the Lentienses, a tribe of the Alemanni. After the invaders had been defeated, G. advanced toward the Eastern Empire, but while on the way, he learned that his uncle Valens had been defeated and killed by the Goths near Adrianople (378, Aug.). The sovereignty of the Eastern Empire then devolved on G., but feeling his inadequacy to the task of ruling the whole empire, he recalled Theodosius (q.v.) from Spain, and appointed him his colleague 379, Jan. 19. G. possessed some admirable virtues: he was pious, chaste, and temperate; his understanding was well cultivated, though not strong, and his eloquence attractive. But his character was too yielding and pliant, and he was consequently often led to the commission of gross acts of cruelty and tyranny, utterly foreign to his nature. His persecution of the pagans, and afterward of heretic Christians, made him a great favorite with orthodox ecclesiastics, but alienated the affections of his subjects generally, while his fondness for frivolous amusements, and unworthy associates, excited the contempt of the army, so that when Maximus was proclaimed emperor by the legions in Britain, crowds of the disaffected flocked to his standard. G. was defeated by him near Paris, and fled to Lyon, where he was overtaken and killed by Andragathius, whom Maximus had sent in pursuit of him.

GRATICULATION, n. *gră-tîk'û-lă'shăn* [F. *graticuler*, to divide into small squares in painting—from It. *graticolare*: L. *craticŭli*, a small hurdle—from *crătēs*, wicker-work, a hurdle]: the art of dividing a plan or design into squares in order the more easily to reduce the copy to a smaller size, or enlarge it.

GRATIFICATION, **GRATIFIER**, **GRATITUDE**, **GRATIFY**, etc.: see under **GRATEFUL**.

GRATIOLA, *gră-tî'ô-la*: genus of plants of nat. ord. *Scrophularineæ*, having a 5-partite calyx, the upper lip of the corolla bifid, the lower trifid, only two stamens fertile, and the anthers pendulous. *G. officinalis*, sometimes called **HEDGE HYSSOP**, is found in meadows and on margins of ponds and river banks in most parts of Europe. It has sessile lanceolate serrulated leaves and axillary solitary flowers. It is extremely bitter, acts violently as a purgative, diuretic, and emetic; and in overdoses is an acrid poison. It is administered in cases of worms, jaundice, dropsy, scrofula, mania, and venereal diseases; but requires to be used with caution. It is said to render some of the Swiss meadows useless as pastures. It was formerly so highly esteemed as a medicine, that the name of *Gratia Dei* (Grace of God) was given to it, and for the same reason it is known in France as *Herbe au Pauvre Homme* (Poor Man's Herb). It is said to be the basis of the famous gout medicine called

GRATIS—GRATUITOUS.

Eau medicinale. *G. Peruviana*, a S. American species, has somewhat similar properties. These properties are supposed to depend upon a bitter resinous principle called *Gratioline*.

GRATIS, ad. *grātīs* [L. *grātis*, freely, for ablative plu. *grātīs*, out of favor or kindness, without reward—from *grātū*, favor]; for nothing; freely; without reward.

GRATITUDE, n.: see under GRATEFUL.

GRATTAN, *grāt'an*, The Right Honorable HENRY: 1746, July 3—1820, June 4; b. Dublin. His father was recorder and M.P. for that city until his death 1766. The year after that event, G., having completed his university studies with distinction at Trinity College, Dublin, entered as a student of law at the Middle Temple, London, where, however, he neglected the pages of Blackstone, to listen to the living oratory of parliament, and in particular of Lord Chatham. He was called to the Irish bar 1772, and sat in the Irish parliament for the borough of Charlemont 1775-90, and then he was elected as one of the representatives of the city of Dublin. Mainly to him was owing, among other things, the partial abolition of the heavy restrictions on Irish commerce. But his popularity ebbed as it had flowed (and oftener than once) in the hearts and huzzas of his impulsive and therefore inconstant countrymen. In 1797, he declined to come forward for Dublin, and went into temporary but undeserved eclipse. In 1800, he was returned for the borough of Wicklow, to oppose the Union, and that was to fight for the people's idea of the constitution. But the union was effected in spite of him, and in 1805 he was returned to the imperial parliament for the borough of Malton, in Yorkshire. Next year, he was induced to stand for Dublin, and was re-elected. He sat for it in successive parliaments till his death in London, whither he had gone, contrary to the advice of his physicians, to advocate, as he had been wont, the cause of Rom. Cath. emancipation.

G.'s public and private character was unimpeachable. For the vacillations of his popularity in Ireland, his countrymen had reason to be ashamed, and it is certain that he now holds a proper and exalted place in the esteem of the people, for whom he labored with such sincerity, integrity, and genius. The history of his life is in great measure the history of the Irish constitution, and entirely the history of the parliament of Ireland.—As an orator, in spite of faulty elocution and peculiarly ungraceful gesture, he stands in the first rank. His style is full of point, rapidity, antithesis, and poetic suggestiveness. His eulogy on Chatham, and his invective against Bonaparte, are not surpassed in British eloquence. His speeches, also *Life and Times*, were published by his son and biographer. A statue of G., on College Green, Dublin, was unveiled 1876.

GRATUITOUS, a. *grā-tū'itūs* [L. *gratu'itūs*, that is done without reward or profit—from *grātū*, favor]: free; not required by justice; without cause or provocation; assumed

GRATUITOUS DEED—GRAUWACKE.

or taken without ground or proof. GRATUITOUSLY, ad. -lī. GRATUITY, n. -ī-lī, a gift; a present; a donation.

GRATUITOUS DEED, in the Law of Scotland: deed granted without any value received; in the law of other countries usually styled a gift (q.v.), or a voluntary conveyance (q.v.).

GRATULATE, v. *grăt'ū-lăt* [L. *gratŭlātŭs*, wished joy to—from *gratŭlor*, I wish joy to, I congratulate]: to salute with declarations of joy; to congratulate. GRATULATION, n. -lăt'shŭn, an address or expression of joy to a person. GRATULATORY, a. -těr-ī, expressing congratulation.

GRATZ (officially GRAZ; formerly *Grätz*): capital of the Austrian crown-land of Styria; picturesque old town, on both sides of the Mur, encircled by gardens and pleasure-grounds. It is 140 m. s.s.w. of Vienna by railway. The inner town, connected with the suburb on the w. side of the river by two chain and two wooden bridges, is surrounded by walls and by a promenade (formerly the glacis) shaded with trees, has narrow and crooked streets, and is not remarkable for cleanliness. It is noticeable for old buildings, e.g., the cathedral of St. Agidi, built in the 14th c.; the ancient castle of the Styrian dukes, with many curious relics of antiquity; the Landhaus, where the nobles of the duchy held their meetings; the university, founded 1585, with its library of 70,000 vols., museum, etc.; the arsenal, and various palaces of the Styrian nobility. G. is well provided with gymnasia and other public educational establishments for the laity, and seminaries for the clergy. As the seat of govt. for the circle, G. has special courts of law and administration, and is of considerable importance. It has manufactures of steel and iron wares, cotton, linen, and woolen fabrics, leather, paper, saltpetre, etc. From its position on the direct line of railway communication between Vienna and Trieste, it is an intermediary station for the trade of the Austrian capital and the Adriatic provinces. G. is the residence of a prince-bishop, and has, besides a Prot. church and a synagogue, 23 Rom. Cath. churches, some very ancient. The country around is singularly beautiful and picturesque. Pop. of G. (1880) 97,791; (1900) 138,080.

GRAUBÜNDEN, or GRAUBÜNDTEN: see GRISONS.

GRAUDENZ, *grow'děnts*: old town in the province of W. Prussia, on the right bank of the Vistula, 60 m. s. of Danzig. A bridge of boats, 2,780 ft. in length, crosses the river. G. contains numerous seminaries and educational establishments, has trade in corn and tobacco, and manufactures woolens, cottons, bricks, and cigars. About a mile n. of it on a hill is the fortress of Graudenz, built 1776, and successfully defended against the French 1807. It was maintained as a fortress till 1873; and now serves as a barrack and a military prison. Pop. (1890) 20,385, including the garrison.

GRAUWACKE: see GRAYWACKE.

GRAVAMEN—GRAVEL.

GRAVAMEN, n. *gră-vă'mèn* [L.—from *grăvis*, heavy, weighty]: cause of complaint or action.

GRAVE, a. *grāv* [F. *grave*—from L. *grāvis*, heavy, weighty: It. *grave*]: serious; sedate; not gay, light, or trifling; weighty; momentous; in *music*, not acute or sharp; deep in sound. **GRAVELY**, ad. *-lī*. **GRAVENESS**, n., or **GRAVITY**, n. *grāv-i-tī* [F. *gravité*—from L. *gravitatem*]: weight; heaviness; seriousness; solemnity: see **GRAVITATE**. **SYN.** of 'grave': solemn; staid; sober; sage; demure; thoughtful; important; influential; plain; low; deep.

GRAVE, n. *grāv* [Ger. *grab*; Dut. *graf*; Icel. *grafi*; Pol. *grob*, a grave: Dut. *grave*, a ditch, anything dug; *graven*, to dig]: *literally*, that which is dug out; the pit in which a dead body is laid: a tomb; a sepulchre; any unhealthy place where many deaths have taken, or do take, place; death: V. in *OE.*, to place in a grave; to dig. **GRAVE-CLOTHES**, the dress in which the dead are interred. **GRAVEDIGGER**, n. one who digs and prepares graves. **GRAVELESS**, a. without a grave. **GRAVE-ROBBING**, offense by statute in most of the states, consisting in unlawful removal from grave or vault, of a dead body, or in opening a vault or grave with intent to steal anything therein. A cognate offense is the receiving of a stolen body.—See **ANATOMY**, in Law. **GRAVE-STONE**, a monumental stone. **GRAVE-WAX**, a familiar term for adipocere, because occasionally found in graveyards. **WITH ONE FOOT IN THE GRAVE**, with the sure prospect of a speedy death.

GRAVE, v. *grāv* [F. *graver*, to carve: Ger. *graben*; Dut. *graven*, to carve, to dig: connected with **GRAVE** 2]: to carve or cut letters or figures on any hard substance, as stone or wood; to carve or form. **GRA'VING**, imp.: N. in *OE.*, carved work. **GRAVED**, pp. *grārd*, or **GRAVEN**, pp. *grā'vn*, carved or cut. **GRA'VE**, n. an engraving tool; one who engraves.

GRAVE A SHIP, GRAVING-DOCK: see under **GRAVES**.

GRAVEL, n. *grāv'ěl* [It. *gravella*; F. *gravelle*, sand: OF. *grave*, rough sand]: small stones or pebbles rounded by the action of water; sandy matter sometimes found in the kidneys or bladder: see **CALCULUS**: V. to cover with gravel; to puzzle; to embarrass; among *horses*, to hurt the foot by gravel in the shoe. **GRAVELLING**, imp. covering with gravel; hurting the foot, as of a horse: N. act of covering with gravel. **GRAVELLED**, pp. *-ēld*, covered with gravel. **GRAVELLY**, a. *-lī*, abounding with gravel. **GRAVEL WALLS**, walls of houses, built up of a conglomeration of cement, or lime, with small pebbles or slag, which materials are kept in place by casings of planks till the walls have hardened—openings having been left for doors and windows.

GRAVEL: small stones ranging from the size of a pea to that of a walnut, usually intermingled with sand, clay, or other substances. Soils in which G. predominates are not as desirable for cultivation as many others. They often contain large quantities of the mineral elements

GRAVELINES—GRAVES.

required by plants, but largely in unavailable condition. Manures applied to G. act quickly, but are liable to lose a large proportion of their valuable constituents by leaching through the soil beyond the reach of plant roots, and by evaporation, which proceeds more rapidly than in compact ground. Gravelly soils are also subject to drought, and crops are often ruined by this cause, while on adjoining loams they suffer but little. These soils are harder to cultivate than loams, and wear plows and other implements much more rapidly. There are many grades of gravelly soils, varying greatly in value for agricultural purposes. In their present state some are almost worthless, being suitable only for pastures, though capable of improvement by the use of fertilizers and the plowing under of green crops: see MANURES (Green Manures). Others, which approach more nearly to loam, are reasonably fertile, and if managed according to their special needs, may be profitably cultivated.

GRAVELINES, *grāv-lēn'*: small fortified town and seaport of France, dept. of Nord, in a marshy location at the mouth of the Aa, 12 m. s.w. of Dunkerque. Although now a desolate-looking town, with grass growing in its streets, it is of historical importance. Here the Count d'Egmont obtained a victory over the French army commanded by the Marechal de Thermes 1558; a victory which compelled the French to accept the severe conditions of the peace of Cateau-Cambrésis. Ten years later, G. was taken by Louis XIV., who had it fortified by Vauban. The inhabitants are employed chiefly in the herring and cod fisheries, and the trade in timber, salt fish, etc. The harbor has now become useless from neglect. Pop. (1896) 5,907.

GRAVELOTTE, *grāv-lōt*: a small town in Lorraine (German since 1871), 8 m. w. of Metz. Here, 1870, Aug. 18, the French sustained a severe defeat by the Germans. The first and second German armies were commanded by Gen. Steinmetz and Prince Frederick Charles, under King William; they numbered 211,000, and lost 904 officers and 19,658 men. Bazaine's force was 140,000; loss 609 officers and 11,605 men. The result of this battle was the shutting up in Metz of Bazaine and his army; the carnage on both sides was frightful, and the French loss in prisoners was abt. 4,000.

GRAVEMENTE, ad. *grā-vā-mēn'tā* [It.]: in music, slowly and in solemn style.

GRAVEOLENT, a. *grā-vē'ō-lēnt* [L. *grāvis*, heavy; *ōlēō*, I smell]: strong-scented. GRAVE'OLENCE, n. *-lēns*, a strong and offensive smell.

GRAVES, or GREAVES, n. plu. *grāvz* [Sw. *grefvar*; Low. Ger. *grebe*; Ger. *gruben*, graves; It. *gruma*, the sediment that sticks to anything, tartar; Sw. *grums*, grounds, dregs]: the dregs at the bottom of the pot in melting tallow made up into cakes as food for dogs, etc. To GRAVE A SHIP, to smear the hull with graves, for which pitch is now employed. GRAVING, n. *grā-vīng*, the act of cleaning a ship's bottom and covering it with pitch. GRAVING-DOCK,

GRAVESEND—GRAVIGRADA

a dock from which the water can be run off in order to smear a ship with graves; an inclosure on the side of a river or on the seashore, into which a vessel can be floated for examination and repairs: see Dock.

GRAVESEND, *grāvz'ënd*: port and borough in Kent, on the right bank of the Thames; 24 m. e.s.e. of London; in a commanding position on the first rising ground after entering the river; G. consists of the old town, with narrow and not cleanly streets, and of the handsome new town w. of the old portion. In the vicinity are extensive market-gardens, great part of the produce of which is sent to London. Many of the inhabitants are employed in fishing. G. forms the limit of the port of London. Here pilots and custom-house officers are taken on board of vessels going up the river. For centuries, the prosperity of the town has depended on its connection with the metropolis. The salubrious air and beautiful scenery at G. render it a favorite watering-place with Londoners. It carries on some ship-building and a considerable trade in supplying ships' stores. Pop. of mun. bor. (1871) 21,260, of parl. bor. 27,493; (1881) 23,375 and 31,355; (1891) mun. bor. 24,067.

G. was originally a *hythe*, or landing-place, and is mentioned as such in Domesday. Around this landing-place a town grew up soon after the Conquest. Here the fleets of the early voyagers, as that of Sebastian Cabot 1553, and of Martin Frobisher 1576, used to assemble; and here the lord mayor, aldermen, and city companies were wont to receive all strangers of eminence, and to conduct them up the river in state, forming floating processions, which, says the historian Froude, were, 'spectacles scarcely rivalled in gorgeousness by the world-famous weddings of the Adriatic.'

GRAVID, a. *grāv'id* [L. *grāvīdūs*, heavy with young—from L. *grāvis*, heavy]: weighty; being with young; pregnant. **GRAVIDITY**, n. *-ī-tī*, pregnancy.

GRAVIER, *grāv-e-ā'*, JACQUES: d. 1708; b. France: missionary. He entered the Soc. of Jesus and went to Canada prior to 1684, in which year he was sent to the Ill. region, where he labored among the Kaskaskia and other tribes of Indians. He succeeded Allouez as superior of the Ill. mission 1690, became vicar-gen. 1691, built a chapel near French Fort on St. Joseph's river for the Miami Indians, and converted and baptized over 200 Kaskaskias in 8 months. He established missions among the Cahokia, Tamarois, Osage, and Missouri tribes, visited Montreal 1696, returned to his Indian labors, was severely wounded by a party of Illinois Indians, and after being unsuccessfully treated in Paris, went to La. 1708, Feb. 12, and died soon afterward in Mobile.

GRAVIGRADA, n. *grāv-ī-grā'da* [L. *gravis*, heavy; *gradus*, a step]: in *paleon*, ground-sloths; tribe of edentate mammals, now extinct; allied to the sloths of the present day, but of the size of the rhinoceros or hippopotamus, though their feet were fitted for digging instead of climbing. They seem to have obtained food by digging around the roots of trees and overturning them. **GRAVIGRADE**, a.

GRAVIMETER—GRAVITATION.

grād, walking heavily; of or pertaining to the edentate tribe or family *Gravi-grada*.

GRAVIMETER, n. *gră-vîm'ĕ-tēr* [L. *grăvis*, heavy; Gr. *mêtrôn*, a measure]: an instrument for ascertaining the specific gravity of bodies, whether liquid or solid. **GRAVIMETRIC**, a. *grăv'ĭ-mĕt-rik*, of or pertaining to; applied to chemical analysis when proceeding by fixed weights, in contradistinction to volumetric.

GRAVINA, *gră-vĕ nă*: commercial and industrious episcopal town in s. Italy, province of Bari, on a hill above the left bank of a stream named G., 37 m. s.w. of the town of Bari. It occupies the site of ancient *Blera*, one of the stations on the Via Appia, which passed at Poggio Orsino, about a mile from the town. In 995, it sustained a memorable siege against the Saracens. It was a favorite hunting-place of Emperor Frederick II. The neighborhood possesses rich pastures, and raises a celebrated breed of horses, in which the inhabitants do a large trade at their annual cattle-fair. Pop. abt. 15,000.

GRAVING, GRAVING-DOCK: see under **GRAVES**.

GRAVITA, *gră vĭ-tă*: Italian term used in music, signifying that it is to be performed with an earnest and dignified expression, with a movement in slow, marked, and solemn time.

GRAVITATE, v. *grăv'ĭ-tăt* [L. *gravitātem*, heaviness—from *grăvis*, heavy; It. *gravita*: F. *gravité*]: to tend toward the centre of attraction. **GRAVITATING**, imp. a. tending toward another body by the law of gravitation. **GRAVITATED**, pp. **GRAVITATION**, n. *-tă-shŭn* [F.—L.]: the peculiar force by which all bodies are drawn to the surface of the earth or in the direction of its centre; the tendency of all bodies, at liberty, to approach each other. **GRAVITY**, n. *-ĭ-tĭ*, weight; heaviness; gravitation; seriousness; solemnity; atrociousness; weight of guilt. **CENTRE OF GRAVITY**, the point of a body which, being supported, all the other parts will be equally balanced. **SPECIFIC GRAVITY**, the relative weight of any solid or liquid as compared with the weight of an equal bulk of distilled water; or of any gas as compared with air: see further, **SPECIFIC GRAVITY**.—**SYN.** of 'gravity': sobriety; enormity; lowness.

GRAVITATION—GRAVITY: peculiar force by which all material bodies tend to draw toward each other: its nature is unknown. All bodies, when raised into the air, and left unsupported, fall to the earth in lines perpendicular to it. The force which causes them to do so is termed gravity, and—universal experience shows—acts towards the earth's centre; more strictly, it acts perpendicularly to the surface of still water. But if a body, as a stone, be projected obliquely into the air, it is made to describe a curved path, having a highest point, vertex, or apogee; and when it meets the earth in its descent, its direction is not the centre, but inclined to it at the angle of projection: see **PROJECTILES**. Observing this, and that the body, if not interrupted by the earth's surface, would continue to move

GRAVITATION—GRAVITY.

in a curve, with its tangent always away from the centre, it is easy to imagine that if not interrupted, it might circulate round the centre as the moon does round the earth. Next, knowing that the force of gravity is exerted at all accessible heights above the earth, the question arises—May it not be exerted as far off as the moon? which we know to be influenced by *some* force which continually deflects it from the tangent to its orbit, and makes it circulate round the earth: see CENTRAL FORCES. Observing now the time of revolution of the moon, and calculating its centrifugal force, which we know must equal the centripetal force, we put the question: Is this force the same as gravity? The answer is, that it is a force 3,600 times less energetic. If, then, gravity be the force which really holds the moon to its path, it must be explained why it acts upon that body so much more feebly than it would, were the moon a body on the earth's surface. The explanation is given at once if we suppose gravity to be a force whose energy diminishes with increase of distance, and is inversely as the squares of the distances at which it is exerted; for the distance of the moon from the earth's centre is about 60 times that of the earth's surface from its centre, and $3,600 : 1 :: 60^2 : 1$. We infer that it does so from the fact, that there is nothing inadmissible in such a diminution of energy with increase of distance—that, on the contrary, there are many analogies for it, as in the emanations of light and heat, and in the argument drawn from the necessity of otherwise supposing some other force than gravity to be employed in deflecting the moon, and the force of gravity to cease at some unknown level. On these views, and a generalization below mentioned, Newton is understood to have at first rested his law of universal gravitation: 'Every particle of matter in the universe attracts every other particle with a force directly proportioned to the mass of the attracting particle, and inversely to the square of the distance between them'—a law, the truth of which, since it was first broached, has been put beyond all question by the most complete body of predictions, fulfilled to the letter, that can be cited in support of any law of nature.

Before, however, the argument on the extension of terrestrial gravity to the sphere of the moon could have become pregnant with so great a result, much investigation had to take place in other fields; and, in fact, Newton had, previously to conceiving the law, explained the three great Keplerian laws of order obtaining in the solar system by reference to an attractive force residing in the sun. These laws of Kepler are—1. That the planets revolve round the sun in ellipses, having the sun for a common focus: 2. That every planet moves in such a way that the line drawn from it to the sun sweeps over equal areas in equal times: 3. That the squares of the times occupied by the several planets in their revolutions in their elliptic orbits, are proportional to the cubes of their mean distances from their common focus, the sun. From the law of equal areas, Newton inferred that every planet is retained in its orbit by a force of attraction directed toward the centre of the

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sun; from the orbits being elliptical, he inferred that in each case this force varies in intensity according to the inverse square of the bodies' distance from the sun; while from the third law he inferred the homogeneity of the central force throughout the solar system. It was then, after being familiar with the notion of terrestrial gravity, and its action, through the researches of Galileo, Huyghens, and Hooke, and with the notion of a central force acting inversely as the square of the distance of its object, through his explanations of the laws of Kepler, that he put to himself the question: Is not the force with which the moon gravitates to the earth the same with gravity?—the force which causes a stone to fall on its surface. A question answered affirmatively on the supposition of gravity, like the sun's attraction, being a force diminishing with increase of distance, and according to the same law. The result was to bring under the law of gravitation the whole solar system, the planets and the sun, and satellites and their planets—the satellites being observed to obey the same laws of order with reference to their primaries that the latter obeyed in reference to the sun. And the imagination lifted up by the grandeur of the conception, would refuse to limit the operation of that law to our own system, even were there no facts to show its extension beyond. The phenomena of double stars, however, would justify the extension and the statement of the law as above given in universal terms. It is to be observed that the Keplerian laws, which may be said to have been the basis of Newton's researches, are, owing to perturbations caused by the mutual action of the planets, etc., only approximately correct; and that these perturbations afford, when examined, a further proof of the truth and universality of the law of gravitation.

For a notice of speculations as to the nature of the law of gravitation, see **FORCE: FALLING BODIES: PROJECTILES: ETC.**

GRAVY, *n.* *grā'vī* [from *graves*, the dregs of melted tallow: Low Ger. *grebe*, graves]: the juice and fat which drip from flesh while roasting; dripping; sauce.

GRAY, or **GREY**, *a.* *grā* [Icel. *grar*; AS. *græg*; Low Ger. *graa*g, gray: Gr. *graios*, aged, gray: the probable original meaning was party-colored]: of a white color tempered with black; hoary; mature: *N.* a color compounded of black and white in various proportions; the badger, from its party-colored face; in *heraldry*, the badger. **GRAY'ISH**, *a.* *-īsh*, gray in a moderate degree. **GRAY'NESS**, *n.* **GRAY-BEARD**, an old man; a large coarse earthenware vessel for holding liquors; formerly stoneware drinking-jugs having a bearded face on the spout; the preceding also spelled **GREY**-. **GRAYHOUND**, another spelling for **GREYHOUND**, (*q.v.*). **GRAYSTONE**, *n.* a volcanic rock of a grayish color.

GRAY, *grā*: small town of France, dept. of Haute-Saône, on the slope of a hill overlooking a beautiful meadow, on the left bank of the Saône, 26 m. w.n.w. of

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Besançon. It is commanded by the remains of an ancient castle, the residence in former times of the Dukes of Burgundy, and has a pleasing appearance from a distance, though its streets are crooked, narrow, and steep. G. is an important entrepôt for goods from the n.e. districts of France, which are conveyed by the Saône to the south. Its trade is chiefly in corn, flour, timber, wine, iron, and colonial produce. Pop. 7,500.

GRAY, grā, ASA, M.D., LL.D.: 1810, Nov. 18—1888, Jan. 30; b. Paris, Oneida county, N. Y.: botanist. He took his degree M.D. 1831, but soon relinquishing the practice of medicine, he applied himself, under Prof. Torrey, to his favorite study of botany. In 1834 he received the appointment of botanist of the U. S. exploring expedition; but as its sailing was long delayed, he resigned his post 1837. He was afterward appointed prof. of botany in the Univ. of Michigan; but before he had entered upon the duties of that office he was elected, 1842, Fisher prof. of nat. hist. at Harvard Univ. In 1853 he retired from teaching to apply himself wholly to science, and 1874 became a regent of the Smithsonian Institute. He ranks among the leading botanists, not only of America, but of the age. In his numerous writings he has shown equal ability in communicating elementary knowledge and in elucidating recondite theories. He came forward at a time when the old, artificial systems of botany were giving way to the natural system which has taken their place, and he was the first in America, in conjunction with Dr. Torrey, who arranged the heterogeneous assemblage of species upon the natural basis of affinity. In 1826 he published *Elements of Botany*, afterward enlarged into *Botanical Text-book*; and 1838 he commenced, with Dr. Torrey, *Flora of N. America*. In 1848 appeared *Manual of Botany for the Northern United States*, and the first vol. of *Genera Borealia Americana Illustrata*. Among his remaining works are *Botany of the United States' Pacific Exploring Expedition, under Captain Wilkie* (1854—58); *How Plants Grow; Lessons in Botany; Structural and Systematic Botany*; a revised edition of *Botanical Text-book*, 1,300 illustrations; *Flora of the Southern United States*; *School and Field Book of Botany* (1869); *Botany for Young People* (1869); *Examination of Darwin's Treatise* (1861); *Flora of N. America* (1878); and *Natural Science and Religion* (1880). Prof. G. has contributed many papers to scientific periodicals and the transactions of learned societies.

GRAY, grā, DAVID: 1838, Jan. 29—1861, Dec. 3; b. Duntiblae, near Glasgow, Scotland: poet. He was the oldest son of a poor hand-loom weaver, who was anxious that he should become a minister. While yet a boy the family removed to Merkland, on the other side the Luggie river, and he was enabled to take a partial course at Glasgow Univ., where he became especially proficient in Greek, Latin, and French, while at the univ. he began writing poems, and after serving some time as a private tutor, went to London and sought literary employment

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1860, but failed.

GRAY, ELISHA, D.S.C.: inventor: b. Barnesville, O., 1835, Aug. 2. He served apprenticeships at blacksmithing, carpentry, and boat-building; studied physical science at Oberlin College, and made mechanical appliances for class-room demonstrations; and received his first patent for telegraphic apparatus 1867, Oct. The principal of his other patents, which aggregate about 50, are for the speaking telephone (1876, Feb.); and the multiplex telegraph (1877, Jan.), by which he sent four messages at the same time on one wire between New York and Boston, and eight messages similarly between N. Y. and Philadelphia. He was author of *Experimental Researches in Electro-Harmonic Telegraphy and Telephony* (N. Y. 1878). D. 1901, Jan. 21.

GRAY, FRANCIS CALLEY, LL.D.: 1790, Sep. 19—1856, Dec. 29; b. Salem, Mass.: lawyer. He graduated at Harvard College 1809, was admitted to the bar, was private sec. to John Quincy Adams while U. S. minister to Russia, and became a member of the Mass. legislature and cor. sec. of the Acad. of Arts and Sciences. He bequeathed \$50,000 for the establishment and support of a museum of comparative zoology in connection with Harvard, and also a collection of 3,000 rare engravings and \$16,000 for cataloguing and keeping it in order. He was pres. of the Boston Athenæum, fellow of Harvard, contributor to the *North American Review*, and author of *Prison Discipline* (Boston 1847).

GRAY, GEORGE: an Amer. jurist. Was atty.-gen. of Delaware 1879-85; U. S. senator, 1885-99; became judge of U. S. Circuit Court of 3rd dist. in the latter year; appointed a member of Peace Commission in Paris, 1898; became president of Joint High Commission at Quebec, 1898, a member of International Commission of Arbitration under the Hague Convention 1900; and chairman of the Anthracite Coal Strike Commission, 1902.

GRAY, HENRY PETERS: 1819, June 23—1877, Nov. 12; b. New York: painter. He studied painting with Daniel Huntington in New York and in the leading European art galleries, lived in New York 1847-72 and Italy 1872-75, made a specialty of portraits and classical subjects, and was pres. of the National Acad. of Design 1869-74. He was an artist of great industry, and painted about 300 portraits beside *Wages of War*, *Hagar and the Angel*, *Cleopatra*, *Charity*, *St. Christopher*, *The Immortality of the Soul*, *Greek Lovers*, *Twilight Musings*, *Normandy Girl*, *Pride of the Village*, and *Apple of Discord*.

GRAY, HORACE: associate justice U. S. Sup. Court; 1829-1902, Sep. 15; graduated at Harvard Col. 1845, and its law school 1849, was admitted to the bar 1851, appointed reporter of the Mass. supreme court 1854, and served till 1862, was associate justice of the Mass. supreme court 1864, Aug. 23—1873, Sep. 5, and chief justice 1873-1881, Dec. 19, when he was appointed successor to Judge Clifford in the U. S. supreme court. Was in charge of the 1st judicial dist., comprising dists. of Me., N. H., Mass., and R. I.

GRAY, JOHN EDWARD, PH.D.: 1800-1875, Mar. 7; b. Walsall, Staffordshire: English naturalist. He was educated for the medical profession. In 1821, he assisted his father (author of *Supplement to the Pharmacopœia*, and other works) in the preparation of his *Natural Arrangement of British Plants*, in which, for the first time in the English language, the new method was adopted. In 1824, G. entered the British Museum as assistant in the nat. hist. dept., where he found scope for his extensive knowledge and accurate observation; and from 1840 till his death he was keeper of the zoological collections: these, the most complete in the world, are a monument of his persevering activity. His success was due partly to his quickness in seizing the peculiar characteristics of animal forms, which rendered him a good classifier. The Royal Bavarian Acad. of Sciences at Munich recognized his services to science by conferring on him the title of PH.D. Dr. G. wrote much on subjects connected with his department. The mere titles of his books and papers make a long list, numbering more than 500. His zoological and natural history catalogues are not mere lists, but are enriched with synonyms and ample notes, whereby study of particular subjects is greatly promoted. Dr. G. assisted in the formation of some of the most prosperous scientific societies of London. He, moreover, claimed to have anticipated Sir Rowland Hill in his proposal for a low uniform rate of postage. Dr. G. died at his residence in the British Museum.

Dr. G.'s principal works are: *Illustrations of Indian Zoology*, 2 vols. folio; *The Knowsley Menagerie*, 2 vols. folio; *Spicilegia Zoologica—on Mammalia, Birds, Reptiles, Fishes, Mollusca, Shells*; *Synopsis of the Contents of the British Museum*; besides catalogues of the specimens in the zoological dept. which have greatly facilitated the study of those collections. He also wrote many valuable scientific papers, in *Philosophical Transactions*, *Transactions of the Linnean Society*, *Encyclopædia Metropolitana*, *Annals of Natural History*, and *Reports of the British Association*.

In 1826, Dr. G. married a lady who rendered him important aid in his studies, and is known as author of *Figures of Molluscan Animals, for the Use of Students*, five vols. In 1832, he was elected a fellow of the Royal Soc., and afterward served on the council. He was a member of some of the principal societies and academies in England and on the continent.—His brother, GEORGE ROBERT G. (1838-72), officer in the zoological dept. of the British Museum from 1831 till his death, was the author of many memoirs on zoology, but is best known as author of *The Genera of Birds*: his list comprises more than 2,900 genera, and 11,660 species.

GRAY, ROBERT: 1755-1806; b. Tiverton, R. I.: navigator. He was bred to the sea, became capt. of the sloop *Washington* fitted out by Boston merchants to trade with the natives of the n.w. coast, sailed 1787, Sep. 30, and returned 1790 by way of Canton, China, having circumnavigated the globe—the first man to carry the American

GRAY—GRAYLING.

flag around the world. During a second voyage in the ship *Columbia* he discovered and named the Columbia river 1791, May 11.

GRAY, THOMAS: English poet: 1716, Dec. 20—1771, July 30; b. London. His father, Philip G., a money scrivener, was of a disposition so violent, that his wife was obliged to separate from him; and it was mainly through her exertions that her son was placed at Eton, and afterward at Cambridge. At Eton, he made the acquaintance of Horace Walpole, son of the prime minister; and when his college education was completed, he accompanied his friend on a tour through France and Italy. After spending a year in the search of the picturesque and in the exploration of picture-galleries, the friends quarrelled, and G. returned to England, and went to Cambridge to take his degree in civil law. At the university, the greater portion of his life was spent, breathing the serene air of noble libraries, and corresponding with friends, after the style of the men of that day. In 1756, in consequence of a practical joke, he removed from St. Peter's College to Pembroke Hall. He had a just appreciation of the natural beauty of his native country, and rambled in Scotland, Wales, and the English lake counties—making notes and writing copious descriptions. He published *Ode to Eton College*, 1747, and *Elegy written in a Country Churchyard* two years afterward. His *Pindaric Odes* appeared 1757, but though brilliant in imagery, and charming the ear with involved and intricate harmony, they did not touch the popular heart like the *Elegy*. On the death of Colley Cibber, he was offered, but declined, the post of poet-laureate. Shortly afterward he was appointed prof. of modern history. Fastidious in his tastes, fond of books and lettered ease, indisposed to mingle in the great world, but delighting to comment upon it in letters to friends, blessed with a reputation peculiarly dear to a scholar's heart, comparatively rich, his life glided on imbittered but by one enemy—gout. Dining one day in the college hall, he was severely attacked, and after suffering a week, he died aged 55 years. He was buried by the side of his mother at Stoke near Eton.—G.'s poetry, with the exception of the *Elegy*—which everybody knows—has never become popular; yet in its own sphere it is nearly perfect; delicately imaginative, curiously studded with imagery; exquisitely finished, like miniatures on ivory. But G.'s subjects are often remote, and out of the track of ordinary human feelings. The best life is that by Gosse (1882).

GRAYLING, n. *grā'ling* [corruption of *gray-lines*, referring to the dusky streaks along the body], (*Thymallus vulgaris*): fish allied to the trout, of the family *Salmonidae*, and of a genus distinguished from salmon, trout, etc., by smaller mouth and much smaller teeth, and by the greater size of the dorsal fin. The scales are also much larger. The G. is found in many streams in England, but is, however, very local; and of two rivers in the same neighbor-

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hood, one may contain it, and the other not. A supposition that it was brought to England by the monks is unsupported by any evidence. It is plentiful in many parts of Europe, and equally in Switzerland and in Lapland. It is abundant in Scandinavian rivers; also in the n. of Asia and America. It is known in Germany as the *Asch* or *Aesche*, in France *Ombre* ('shadow,' from its quick elusive movement), in Upper Italy *Temola*. It inhabits clear streams, with rocky or gravelly bottoms, and 'seems to require an alternation of stream and pool.' It will live in clean newly-made ponds in hard soil, though it does not breed in them, but will not live in those of muddy bottom. Its food consists chiefly of flies and aquatic larvæ, and it is taken by angling in the same manner as the trout. It very rarely attains a weight of four pounds. The back and sides are silvery gray, marked



Grayling (*Thymallus vulgaris*).

with numerous longitudinal dusky streaks; the dorsal fin is spotted, the spots arranged in lines across the fin. The abdominal line is almost straight, the dorsal line considerably elevated. The G. is greatly esteemed for the table, but requires to be cooked when newly caught, when it has an odor which has been compared to that of wild thyme. It spawns in April or May, and is in the best condition when trout are out of season, in Oct. and Nov.—There are several other species of *Thymallus*: one *T. signifer*, a very beautiful fish inhabiting the clear affluents of the Mackenzie river, British America, is called *Hewlukpowak*; or the *fish with the winglike fin*, by the Esquimaux. It is said to afford excellent sport to the angler; though the streams in which it is found are visited by few anglers for amusement. Angling for grayling is excellent sport. It rises to the same flies as those used for trout: it takes also worms, maggots, and other small larvæ and insects. From July till the end of Oct. is the best season for the fishing, but in fine open days the sport may be had through the winter.

GRAY'S INN: one of the four Inns of Court in London, having the sole power of calling persons to the degree of barrister-at-law: see **INNS OF COURT**.

GRAYSON, *grā'son*, **WILLIAM**: d. 1790, Mar. 12; b. Prince William co, Va.: legislator. He graduated at Oxford Univ., studied law at the Temple, London, and settled in Dumfries, Md., to practice. In 1776 he was ap-

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pointed aide-de-camp to Washington, 1777 col. of a Va. regt., 1778 distinguished himself at the battle of Monmouth, 1780-1 was a member of the board of war, 1784-87 member of the continental congress, 1788 member of the Va. convention which adopted the Federal constitution, and 1789 till his death a senator in the 1st congress.

GRAY'S PEAK: elevation of the Rocky Mountains in Summit and Clear Creek cos., Colo., on the e. border of the Middle Park, lat. 39° 38' n., long. 105° 48' 46" w., 12 m. w. of Georgetown, 48 m. w. of Denver, height 14,466 ft. It was named in honor of Prof. Asa Gray, as its twin of the same height was named for Prof. Torrey. Its sides are covered with forests of large evergreen trees.

GRAYWACKE, *grā-wāk-ě*: partially translated German word (*grauwacke*), formerly used to denote an indurated argillaceous rock, conglomerate of rounded pebbles and sand, common in, though not confined to, the Silurian and Cambrian strata: the term has almost passed out of use.

GRAZALEMA, *grā-thā-lā'mā*: small town of Spain, province of Cadiz, about 60 m. e.n.e. of the city of Cadiz, in a strong position on a rocky hill approachable only by a narrow and easily defended ledge, between the Sierra de Ronda on the e., and the Cerro de S. Cristoval on the west. It was compared by the French (a whole division of whom were here repulsed by the inhabitants) to an inland Gibraltar. Much smuggling, and, it is suspected, robbery, is carried on by the inhabitants. Pop. 8,000.

GRAZE, v. *grāz* [Ger. *kratzen*, to scratch: Icel. *krassa*, to scratch, to tear: F. *raser*, to shave (see GRATE 2)]: to rub or brush lightly anything in passing; to touch and glance from, leaving a very superficial wound. **GRA'ZING**, imp. **GRAZED**, pp. *grāzd*.

GRAZE, v. *grāz* [AS. *grasian*, to graze—from *græs*, grass: Dut. *grazen*, to graze]: to furnish pasture for; to feed on grass; to supply grass. **GRA'ZING**, imp.: **ADJ.** supplying pasture; feeding on grass: **N.** the act of feeding on grass; a pasture. **GRAZER**, n. an animal which grazes. **GRAZIER**, n. *grā'zhēr*, one who pastures cattle and rears them for market.

GRAZIOSO, ad. *grāt'zī-ō-zē* [It.]: in music, an intimation to perform the music smoothly and gracefully.

GRAZZINI *grāt zē'nē*, ANTON FRANCESCO: 1503, Mar. 22—1583, Feb. 18; b. Florence, Italy: author. Nothing is known of his early life excepting that he carried on the apothecary's business, but his name is famous in the literature of Italy. He was founder of the Academy of the Humid 1540, and of the Accademia della Crusca 1582, and in both he was usually spoken of as IL LASCA or LEUCISCUS, and engaged in many literary quarrels. His chief works are *Le Cene*, a collection of stories on the Boccaccian plan, and many prose comedies, including *La Gelosia*, *La Spiritata*, *La Arenga*, *La Sibilla*, and *I Parentadi*. He also is known to have edited the works of Berni.

GREAL, n. *grēl*: see GRAIL.

GREASE.

GREASE; n. *grēs* [It. *grascia*, grease: F. *gras*; OF. *cras*, fat—from mid. L. *crassus*, thick, fat: F. *graisse*, grease: Gael. *creis*, grease]: soft animal fat, as tallow or lard. **GREASE**, v. *grēz*, to smear, rub, or anoint with fat. **GREASING**, imp. *grēzing*, smearing with fat or oily matter. **GREASED**, pp. *grēzd*. **GREASY**, a. *grēzī*, oily; of or like grease; smeared or covered with grease. **GREASILY**, ad. *grēzī-lī*. **GREASINESS**, n. *-zī-nēs*, oiliness; fatness.

GREASE, n. *grēs* [F. *graisse*; It. *grascia*, grease]: a disease in horses, consisting of inflammation of the skin at the back of the fetlock and heels, on which pustules form, yielding a fetid, purulent discharge.

GREASE: term of general application to all oily or fatty matters, but generally to those having some degree of solidity, as tallow. It is specially applied to fatty matters which are so deteriorated with dirt or other impurities as to be unfit for candle-making and other manufactures requiring some degree of purity in the material. G. is largely employed as a lubricant for machinery, especially for wheels of carriages. G. for the axles of carriages and carts consists of the most inferior kinds of grease mixed with a little tar.—In commerce, the term Mares' Grease denotes the fat of horses (chiefly mares) which are killed in large numbers at Buenos Ayres and Monte Video: their products, consisting of hides, grease, bones, and hair, are largely exported. It is a very oily fat, and so penetrating, that there is difficulty in making casks sufficiently tight to prevent leakage. It is well adapted for lubricating machinery.

Locomotive Grease is, in reality, a kind of soap, a small portion of soda being mingled with the materials to effect an imperfect saponification. The object is to prevent the too rapid melting of the material, which, without this precaution, would be excessively rapid, owing to the heat caused by the friction of the wheels revolving with such rapidity. It is made of the best materials, and consists generally of the vegetable fats called cocoa-nut oil and palm-oil; sometimes animal fat is used. This composition is placed in small metal boxes on the axles, with which they communicate by a small hole, so that, as the axle heats the surrounding parts, the grease in the boxes melts, and runs through the little orifice on to the axle. Oil is the lubricator for the delicate parts of the locomotive, but G. is necessary for the axles of the wheels. So vast is the quantity used, that the annual demand amounts to many thousands of tons; and, as the quality is very important, most of the great railway companies make their own—establishing a marked distinction between the two kinds used for locomotives and for wagons. Locomotive G. usually consists of tallow, oil, carbonate of soda and water. Much depends on the consistency. If the G. is too thick, the axle-boxes become hot; if too thin it is used up too quickly. Again, if there is too much alkali, a residue is left in the boxes; if too little, the G. is too soft and wasteful. The G. is always yellow; but it is made of

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thinner consistency for cold weather than for hot. The following are given as the constituents of two approved kinds, to produce one ton of each kind, allowing a certain percentage for waste:

	WINTER.			SUMMER.		
	cwts.	qrs.	lbs.	cwts.	qrs.	lbs.
Tallow,	8	3	0	4	2	0
Palm-oil,	2	2	0	2	2	0
Sperm-oil,	0	1	7	0	0	27
Alkali,	1	0	14	1	0	8
Water,	12	3	12	12	0	26

The manufacture is very simple. The tallow and oils are heated to 180° F.; the water and alkali to 200°; both are run off into wooden tubs, where they are well stirred till cold, with special precautions against the admission of any grit or dirt.

Wagon Grease is coarser and cheaper in quality. The ingredients are chiefly some kind of resinous oil and caustic lime. When resin is cheap, wagon G. costs about half the price of locomotive G., and is useful also for low-speed locomotives. The increase in price of resin during the civil war led to attempts to use residues from paraffin, coal-tar, candle-making, cotton seed oil, fish-oil, pitch-oil, and other substitutes. See BEAR'S GREASE.

GREASE-WOOD, *grēs-wūd*: plant of the order *Chenopodiaceæ*, very abundant in the far w., and known botanically as the *Sarcobatus vermiculatus*. It forms a noticeable feature of numerous barren regions that are heavily charged with alkaline salts.

GREAT, a. *grāt* [Dut. *groot*; Ger. *gross*]: large or considerable in bulk, dimensions, or number; weighty; adorable; marvellous; principal; having rank or power; illustrious; eminent; of a high and noble character; expressing an extension or unusual degree of a thing; pregnant; a word used in the more remote steps of consanguinity, either ascending or descending, as *great* grandfather; hard, difficult, or grievous. **GREAT'LY**, ad. *-lī*. **GREAT'NESS**, n. largeness; extent; high degree, rank, or place; eminence; elevation of sentiment; magnificence; grandeur. **GREAT-COAT**, an overcoat. **A GREAT WHILE**, a long time. **THE GREAT**, people of rank or distinction. **GREAT-HEARTED**, noble; undejected. **GREAT CIRCLES**: see under **CIRCLE**. **GREAT CIRCLE SAILING** (see below). **GREAT Go**, the familiar slang term for a university examination for a degree, the preliminary or previous examination being termed the **LITTLE Go**. **BY THE GREAT**, in the gross or whole.

Note.—The applications of **GREAT** are very numerous, and it often imparts merely an intensive or emphatic meaning to a noun.—**SYN.** of 'great': important; considerable; chief; venerable; wonderful; general; noble; excellent; magnanimous; generous; high-minded; opulent; sumptuous; magnificent; swelling; proud; big; grievous; grand;—of 'greatly': much; considerably; magnificently; nobly; illustriously;—of 'greatness': bulk; size; magnitude; elevation; dignity; distinction; power; command; pomp; magnanimity; nobleness; force; intensity.

GREAT BARRINGTON—GREAT BEAR LAKE.

GREAT BARRINGTON, *grāt bār'ing-ton*: town in Berkshire co., Mass.: on the Housatonic river and the Housatonic railroad; 25 m. s. by w. of Pittsfield, 40 m. s.s.e. of Albany, 85 m. n. of Bridgeport. It is encircled by picturesque hills, contains 5 churches, high school, 1 national bank (cap. \$200,000), 1 savings bank (cap. \$10,309), valuable marble-quarries, paper, cotton, and woolen-mills, blast-furnace, and pig-iron, brick, and lumber-works. It is lighted by gas and electricity, supplied with fine spring-water, and is of high repute as a summer resort. It was originally known as the Housatonic Propriety, settled 1730, incorporated 1761, and co. seat till 1787. Pop. tp. (1870) 4,320; (1880) 4,653; (1890) 4,612; (1900) 5,854.

GREAT BA'SIN, formerly **FREMONT'S BA'SIN**: remarkable tract of country in w. of Utah State, bounded w. by the Sierra Nevada, and e. by the Wahsatch Mountains. It is abt. 500 m. in extent from e. to w., and abt. 350 m. from n. to s.; is girdled on every side by high mountains, while detached groups cross its whole area; and is abt. 5000 ft. above sea-level. The Humboldt River Mountains, rising 5,000 to 7,000 ft. above the surrounding country, traverse the plateau near its centre. This basin contains many lakes and rivers whose waters never reach the ocean, but are either taken up by evaporation, or are lost in the more arid districts. The G. B. presents many features of a desert: some portions are covered by a yielding mass of sand, salt, and clay; others by a crust of alkaline and saline substance.

GREAT BEAR LAKE: see **BEAR LAKE, GREAT**.

GREAT BRITAIN.

GREAT BRITAIN, *brīt'an*: recognized designation, from the time of James I. of the **ISLAND** comprising England and Scotland; formal designation since the union of the two kingdoms, 1707. The official designation of the kingdom in its political unity since 1801, Jan. 1, is **THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND**. The geology and geography of the island of G. B. are given here; also general statistics of the United Kingdom of G. B. and Ireland. For historical sketches of England and Scotland before the union of the two kingdoms, see **ENGLAND**; **SCOTLAND**; for the history of Ireland previous to its union with Great Britain, see **IRELAND** (also for its geography).

THE ISLAND OF GREAT BRITAIN—so called to distinguish it from *Britannia Minor*, or *Little Britain* (see **BRETAGNE**) in France—lies between lat. $49^{\circ} 57' 30''$ and $58^{\circ} 40' 24''$ n., and between long. $1^{\circ} 46'$ e. and $6^{\circ} 13'$ w.; largest island in Europe. It is bounded n. by the Atlantic, e. by the North Sea, s. by the English Channel, w. by the Atlantic, the Irish Sea, and St. George's Channel. The most northerly point is Dunnet Head, in Caithness; the most southerly, Lizard Point, in Cornwall; the most easterly, Lowestoft Ness, in Suffolk; and the most westerly, Ardnamurchan Point, in Argyleshire: greatest length about 608 m., and greatest breadth (from Land's End to the e. coast of Kent) about 320 m.; about 89,600 sq. miles.

Geology.—The geology of G. B. is of peculiar importance. The rocks of the earth's crust having been first systematically studied and expounded here, British geologists have given to the world the names whereby the various strata are known, and British rocks form the typical series of the earth's strata. The whole recognized series of stratified deposits occur in Britain, one or two only being more fully developed elsewhere; and it is only in these singular cases that the foreign equivalents are taken as the types. British geology is no less important from its influence in the development of the country. The mineral wealth, especially the coal and the iron, are the real sinews and muscles of Britain's power. No other country has developed similar advantages in so compact an area.

Following the order of the strata, beginning with the lowest and oldest, it may be said that, in general, the mountainous regions of the n. and w. are formed of the oldest sedimentary rocks, and that, as we move s.-eastward, we gradually pass over newer strata, until, in the e. of England, we come to the only extensive Pleistocene deposits in the country.

The base rocks of the whole series occur in the outer Hebrides, in Tiree and Coll, and along the w. shores of Sutherland and Ross. The true position of these strata has been only recently determined by Murchison and Geikie, who, noticing that their strike was at right angles to the beds resting above them, discovered that they were older than the superimposed Cambrian rocks. They consider them the equivalents of the *Laurentian system*, described by Sir W. Logan in Canada. The predominant rock is crystalline gneiss. A band of limestone occurs on the n.e. shore of

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Loch Maree, but this has hitherto proved unfossiliferous.

Resting on the convoluted edges of this old gneiss, on the mainland, and forming the basement rocks in Cumberland, Anglesey, and N. Wales, are the *Cambrian series* of deposits. In Scotland, these rocks are brownish-red sandstones and conglomerates; in England and Wales, they are sandstones, gritstones, and slates. A few fossils, chiefly impressions of supposed fucoid plants, annelid tracks, and zoophytes, have been found in the slates.

The *Silurian measures* occupy a large portion of the surface. The typical rocks occur in Wales, extending over the w. portion of the principality from Pembroke to Denbigh, and including the n. portions of Pembroke, Caermarthen, and Brecknock, the whole of Radnor and Montgomery, the s.w. of Denbigh, and the whole of the counties to the west. The oldest or Lower Silurian beds are next the coast. The series consists of an immense thickness of shales, slates, and sandstones, with intercalated limestones more or less pure. Immense tracts have hitherto proved devoid of fossils; in other districts, the calcareous rocks are almost entirely composed of the remains of marine invertebrate animals, while the shales abound in zoophytes and crustacea. The high lands in n. Lancashire and s. Westmoreland are Silurian; but it is in Scotland that these strata are most extensive; indeed, almost the whole country consists of Silurian strata, with the exception of a large trough in the centre, occupied with newer rocks. A line drawn from Dunbar to Girvan forms the n. limits of these beds in s. Scotland. Except the lower half of the valley of the Tweed, The whole region from this line to near the base of the Cheviots is Silurian. The rocks are chiefly graywacke, with scattered beds of impure limestone. The chief fossils are graptolites, crustacea, and mollusca. The lead-mines of Wanlockhead and Leadhills are in this district. The line drawn from Stonehaven to Helensburgh would mark the termination of the Silurian strata, which compose the whole of n. Scotland, with the exception of the newer beds on the n.e. coast, and the Laurentian and Cambrian series above described. All the series is greatly metamorphosed; the lower strata are converted into quartzose flagstones and quartz rock, the upper into chlorite and mica slate, and quartzose and gneissose rocks.

The *Old Red Sandstone strata*, consisting of conglomerates, coarse and fine grained sandstones, and dark-colored schists, with the characteristic fossils of ganoid and placoid fish, overlie the Silurians in several districts in Scotland. Nearly all Caithness and the seaward portions of Sutherland, Ross, Cromarty, Inverness, Nairn, and Moray, belong to these strata. A broad band, rising on the e. coast between Stonehaven and St. Andrews, stretches across the country to Helensburgh and Dumbarton on the west. The same strata appear again in Haddington, Berwick, and Roxburgh, in Lanark, and in Ayresshire. An extensive tract of these strata occurs in S. Wales and the neighboring English counties, extending from the Silurian district to the Severn and

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the Bristol Channel, and containing in a large basin the s. Wales coal-field. The highly fossiliferous strata of n. Devon, and of s. Devon and Cornwall, belong to this period. They consist of slates, sandstones, and limestones, and contain numerous corals and shell-fish.

The strata of the *Carboniferous period* may be said to occupy a broad tract extending from the Bristol Channel to the base of the Cheviots. They are not continuous between these limits, but are broken up in some places by the appearance on the surface of older strata, while in others they are covered by newer deposits. The various detached coal-fields are: (1) s. Wales, in Glamorgan and Pembroke; (2) Bristol, and (3) Forest of Dean, in Gloucester; (4) Forest of Wyre, in Worcester; (5) Shrewsbury, and (6) Colebrook Dale, in Shropshire; (7) North and (8) South Staffordshire; (9) Warwickshire; (10) Leicestershire; (11) Flint and Denbigh; (12) Lancashire; (13) York and Derby; (14) Cumberland; and (15) Northumberland and Durham. In the n. portion of this great tract of coal-measures, where the millstone grit and carboniferous limestone are largely developed, no seams of coal of any value are contained. The limestone in Derby is rich in metallic ores. The carboniferous strata of n. England extend beyond the Cheviots into Scotland, forming a narrow band from the Solway to the North Sea, in the counties of Dumfries, Roxburgh, and Berwick. The only coal-field in this district is one of small extent at Canonbie, in Dumfriesshire. The carboniferous strata in Scotland, with the exception just stated, are confined to the immense trough between the Silurian measures on the s. and the Old Red Sandstone on the n., which is completely occupied by them, except where the Old Red Sandstone rises to the surface. Considerable tracts of sandstone and limestone without coal break up the true coal-bearing measures into the following coal-fields: the Mid-Lothian, the Fife, the Lanark and Stirling, and the Old Cumnock, in Ayrshire. Besides coal, the whole of the carboniferous series contain immense stores of argillaceous carbonate of iron, the ore from which is produced the great bulk of the iron used in the country. The sandstones of this period form beautiful and durable building-stones, the limestones are of great commercial value, and many of the less indurated shales are good fire-clays.

Permian strata, consisting of magnesian limestone and sandstone colored with oxide of iron, occupy a considerable area in Durham, and border the carboniferous rocks in Dumfries, Cumberland, Westmoreland, Lancashire, Cheshire, Shropshire, Stafford, Worcester, Warwick, Nottingham, and York, and in Glamorgan. The sandstone is quarried for building.

The typical triple series of the *Triassic measures* occur in Germany; the British representatives consist of variously colored sandstones and marls. They occupy a considerable surface in Lancashire, Cheshire, Shropshire, and Stafford, and extend, as a ribbon of varying breadth, from the mouth of the Exe, through Devon, Somerset, Gloucester,

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ter, Worcester, Warwick, Leicester, Nottingham, York, and Durham, to the coast at Hartlepool. The only deposits of rock-salt in Britain occur in the triassic rocks of Cheshire and Worcestershire.

The *Lias* consists of white sandstones, limestones, shales, marls, and alum slates. They abound in fossils, especially in the remains of reptiles, fishes, mollusca, and encrinites. The strata of this age occupy a band between the Trias and the Oolite, extending from Lime Regis to the mouth of the Tees. Two small tracts of lias occur, one in Glamorgan, and the other in Shropshire. In Scotland, small patches are at Brora in Sutherland, and in the islands of Skye, Eigg, and Mull.

The *Oolite measures* are composed of an extensive series of limestones, sandstones, and shales, which occupy a belt nearly 30 m. broad from Yorkshire to Dorsetshire, passing through Lincoln, Northampton, Huntingdon, Bedford, Buckingham, Oxford, and Wilts. The best building-materials in England are obtained from these strata. Oolite strata occur in Scotland at Brora and in Skye. In the Brora Oolite, a seam of coal $3\frac{1}{2}$ ft. in thickness has been worked for more than a century: it is the thickest bed of pure vegetable matter detected in any Secondary formation in Britain.

The fresh-water *Wealden series*, with their abundant remains of reptiles, fishes, shells, and insects, occur in Kent and Sussex, in the Isle of Wight, and in s. Devon.

The beds of the *Cretaceous period*, consisting chiefly of chalk with intercalated sands and clays, all very rich in fossil remains, occupy a broad tract e. of the Oolite strata, and parallel to them. Beginning a little n. of Flamborough Head, they may be traced through York and Lincoln, then across the Wash into Norfolk, Suffolk, Hertford, Buckingham, Oxford, Berks, to Hampshire, where they separate into three arms, one extending s.w. through Wilts and Dorset to the s. coast; another s.e. to Beachy Head; the third stretching as a narrow band e. through Surrey and n. Kent, widening out as it nears the coast, where it occupies the district between Ramsgate and Folkstone.

Eocene strata, consisting of clays, sands, and marls, abounding in fossils which indicate a sub-tropical climate, occupy the valley of the Thames from Hungerford to the sea, and from Canterbury to Saxmundham, as well as a large district in Dorset, Hants, and Sussex, from Salisbury w. to Dorchester and e. almost to Hastings.

Unless the beds in Mull, containing the numerous impressions of exogenous plants, are *Miocene strata*, there are no representatives of this period in Britain.

The *Pliocene deposits* of ferruginous shelly sand and marl known as red crag occur chiefly in Suffolk. The still more recent *Pleistocene deposits* of fresh-water sand and gravel and mammaliferous crag are found on the coasts of Norfolk, Suffolk, Essex, and Kent. The till and glacial beds of the same age are scattered as superficial deposits over large districts. Fossiliferous beds of this age occur in Caithness, in the valley of the Clyde, and in Lanca-

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shire; they contain remains of mollusca, many of which still live in the seas of boreal America.

Minerals—Coal.—From the collieries in Britain (1886) were raised 157,518,482 tons of coal, the lowest total for 15 years. The greatly increasing consumption of coal has originated fears as to the possibility of the exhaustion of the mineral fuel. It appears that in 1820, only 15,000,000 tons were raised; in 1840, the amount was 30,000,000; and in 1860, nearly 84,000,000. Dr. Edward Hull has calculated that the known and concealed coal within a workable distance from the surface would last more than 1,000 years: see COAL. The consumption during the last twenty years of the century would, at the increasing ratio of recent years, amount to above 1,460 million tons a year, a quantity vastly greater than can possibly be used. The output of coal (1901) was 219,046,945 tons, value at the mines \$528,000,000.

Iron.—Formerly, the only iron produced in the country was obtained from the greensand of the s.e. of England, and from the brown hematite of the Dean Forest. The ore was smelted with charcoal. But the introduction of coke and coal for smelting, and the discovery of numerous additional and unexpected deposits, especially in connection with coal-bearing strata, has immensely increased the production of iron, and met the greatly increased demands for this metal. In 1760, when charcoal alone was used for smelting, not more than 25,000 tons of iron were produced; in 1860, no less than 3,826,752 tons were obtained from 8,024,206 tons of ore. The market value of the metal was \$61,741,197. In 1901 the total iron-ore production of United Kingdom, of which returns were received, amounted to 12,275,198 tons, value \$16,000,000. The most important ore is the ferruginous shale, or impure argillaceous carbonate of iron, which occurs in connection with every coal-field of Britain. The brown and red hematite, associated with the oldest palæozoic rocks, yield also a large amount of metallic iron.

Tin is obtained from only two counties—Cornwall and Devon. In 1901 the product of metallic tin was 7,288 tons, value \$2,221,000.

Copper is obtained principally from the same two countries. There are about 65 different mines, which produced (1880) 52,118 tons of ore, yielding 3,662 tons of metallic copper, value \$1,230,926; and (1901) 6,407 tons of ore, value \$134,000. In 1860 there was a yield of 13,789 tons of ore, producing 935 tons of metal, value £100,691 chiefly from the counties of Lancaster, Caermarthen, and Anglesey, small quantities being supplied from Cumberland, Chester, Cardigan, and Isle of Man.

Lead and *Silver* are obtained from the same ore from numerous mines in Palæozoic districts. The most productive English mines are in Northumberland, Durham, Cumberland, York, and Derby, in Shropshire, and in Cornwall and Devon. Small quantities are obtained in Somerset, Westmoreland, Stafford, and Chester. All the Silurian counties of Wales contain mines. The Isle of Man yields

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nearly 3,000 tons of ore. In Scotland, the most productive mines are at Wanlockhead and Leadhills; Argyll, Perth, and Kirkeudbright supply small quantities. The total amount of ore raised 1880 was 72,245 tons, yielding 56,949 tons of metal, value \$4,635,629. The value of ore 1901 was \$1,183,981.

Zinc is obtained from Cornwall and Devon, Cardigan and n. Wales, Derby, Cumberland, and the Isle of Man. The produce 1880 was 27,547 tons of ore, value £98,545. The metallic zinc obtained from this amounted to about 7,162 tons, value \$600,423. The product 1901 was 23,752 tons, value at the mines \$343,813.

Sulphur ores (iron pyrites) were raised in different parts of G. B., chiefly in Cornwall, to the extent (1901) 10,238 tons, value \$22,031.

The following minerals also are raised in Cornwall, viz., arsenic, manganese, gossan, nickel, silver-copper, fluorspar, and wolfram.

Salt occurs in Cheshire, Worcestershire, Staffordshire, and Ireland: produce 1,783,056 tons, value \$2,773,731.

The mineral products of G. B. amounted in value at the mines (1901) \$514,619,025.

Physical Geography.—The physical features of a country are intimately connected with its geological structure. The older Palæozoic rocks produce mountainous regions, intersected with deep and narrow valleys. The newer strata seldom rise to a great height. Their high lands are rounded undulations of the strata, except where igneous rocks are intruded, and the valleys are broad and shallow. In Scotland are consequently two extensive mountainous districts, occupied chiefly with rocks of Silurian age, and an intervening valley filled with Old Red Sandstone and Carboniferous measures. The n. mountain region is intersected by the Great Glen, which is a fissured anticlinal axis in the Silurian strata. It is difficult to group the mountains in this district. The Grampians from Aberdeen to Argyle show the most marked linear arrangement: the greatest eminence in this range is Ben Lawers (3,984 ft.). Between the Grampians and the Great Glen, a succession of great eminences occur, the highest of which, and the culminating point of all the British Isles, is Ben Nevis (4,406 ft.). N. of the valley of the Caledonian canal, the region is a confused mass of mountains, reaching, in Ben Attow, 4,000 ft. Caithness consists of plains of undulating sandstone, covered with drift; the headlands and sea-cliffs in this county are bold and striking. The coast-line of the Palæozoic region of n. Scotland is repeatedly broken by numerous and large friths or sea-lochs, and the interior abounds in picturesque lakes. The Silurians of s. Scotland form an extensive mountain range crossing the island from St. Abb's Head to Stranraer. The rocks are less indurated than in the n.; the scenery is consequently not so wild. The mountains have generally broad, flattened forms, intersected by deep pastoral glens, which widen out into broader valleys and dales. The principal heights are

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Hartfell (2,790 ft.) and Black Larg (2,890 ft.). The great central valley of Scotland embraces the basins of the Clyde, Forth, and Tay. It contains several tracts of rich table-land and is frequently broken through by igneous rocks, chiefly trappean, which project into bold and picturesque hills.

England and Wales, in the Cambrian and Silurian districts, have the same mountainous character as similar districts in Scotland; but as so much of England is occupied with newer strata, it may be considered on the whole a level country, traversed by ridges of varying elevation, which form the water-sheds. The range, beginning with the Cheviot Hills, is continued from the borders of Scotland southward, as the Pennine range, through Northumberland, Cumberland, Westmoreland, Lancashire, and Yorkshire, to the middle of Derbyshire; it varies in height from 1,200 to 3,000 ft., reaching its highest summit in Crossfell, Cumberland, 2,929 ft. The band of Lias and Oolite, from Yorkshire to Dorset, forms a tortuous range of table-land, rising sometimes into hills to the height of 1,500 ft., and throughout its course presenting generally a bold escarpment to the w., and having a gentle slope to the east. W. of this range of table-land, are the valleys of the Yorkshire Ouse, the Trent, and the Severn; on the e., the Great Ouse and the upper portion of the Thames. Beyond these two rivers, the country rises into a range of low chalk-hills, which follow the cretaceous strata from Norfolk to Wilts, dividing with the strata into three ranges, two of which take an easterly direction through Sussex and Surrey and Kent, bordering the Wealden strata, and forming the South and North Downs. Devon and Cornwall are mountainous, from the intrusion of granite and other igneous rocks through the Palæozoic strata.

For the details of the physical geography, see titles of the several counties, lakes, rivers, etc.

Climate.—The climate of G. B. derives its peculiar character from its insular situation, in connection with the prevailing direction of the winds. It is mild and equable in a remarkable degree, the winters being considerably warmer and the summers cooler than at places within the same parallels of latitude. For at least three months, the mean monthly temperature ranges between $50^{\circ}\cdot 0$ and $60^{\circ}\cdot 0$; for other three months it continues about $60^{\circ}\cdot 0$, or occasionally a little higher, seldom more than three degrees; and for the remaining six months it ordinarily ranges between $36^{\circ}\cdot 0$ and $48^{\circ}\cdot 0$. Since the reports of the registrar-general clearly prove that the temperature most conducive to health is between $50^{\circ}\cdot 0$ and $60^{\circ}\cdot 0$, it follows that, as far as concerns temperature, the climate of G. B. is one of the healthiest in the world.

As appears from data in Reports of the English and Scottish Meteorological Societies, the mean temperature of England is $49^{\circ}\cdot 5$, of Scotland $47^{\circ}\cdot 5$. The mean temperatures of the following places, arranged according to the latitude, have been deduced from the same sources: Guernsey $50^{\circ}\cdot 2$; Truro $51^{\circ}\cdot 3$; Ventnor $51^{\circ}\cdot 5$; Barnstaple $50^{\circ}\cdot 8$; Aldershot

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49°·4; Greenwich 49°·5; Bedford 49°·3; Derby 48°·8; Liverpool 48°·9; Manchester 48°·0; Isle of Man 47°·8; Scarborough 47°·0; Milne-Graden (Berwick) 46°·8; Dalkeith 46°·9; Rothesay 47°·8; Greenock 47°·9; Arbroath 46°·6; Culloden 46°·8; Tongue 46°·5; Sandwick (Orkney) 45°·6; and Bressay (Shetland) 45°·3. There is thus a difference of fully six degrees between Ventnor, in the Isle of Wight, and Shetland. As this difference is attributable chiefly to the difference of their latitudes, it follows that it will become greater as the force of the sun's rays increases; and hence, while the winter temperatures are respectively 42°·2 and 39°·5, the summer temperatures are 61°·8 and 53°·4. An approximately regular decrease of temperature with an increase of latitude will be observed, particularly if the places on the w. side of the island be regarded as a distinct series by themselves. It will appear, on examination, that the temperatures of places on the w. are about a degree in excess of those of places in the same latitudes but at some distance from the Atlantic. In winter, the difference between the w. and the other parts of the country are still greater. Thus, while the winter temperature of Truro is 45°·0, Guernsey 43°·8, Ventnor and Barnstaple 42°·2, Isle of Man 41°·8, Liverpool 40°·6, and Greenock and the whole of the w. coast of Scotland as far as Shetland 39°·5,—that of Greenwich is 37°·9; Nottingham 37°·3; York 37°·1; Scarborough 38°·8; Dalkeith 37°·0; Arbroath 37°·1; and Culloden 38°·2.

The s.w. winds are the most prevalent throughout the year, except in April and May, when they give place to the n.e. winds. The notoriously dry and parching character of the latter render them very deleterious to health. On the other hand, the s.w. winds, coming from the Atlantic, are moist and genial, and it is on their greater frequency—being, as compared with the n.e., in the proportion of two to one—that the salubrity of the climate in great measure depends.

In those districts of England where hills do not interfere, the annual rainfall is about 25 inches, and in similar parts of Scotland about 28 inches; but these amounts, which may be considered as the minimum, are variously increased by proximity to hills, according as the place is in the e. or w. of the island, viewed in relation to the direction of the wind which brings the rain, and by its lying to the wind or lee side of these hills. Since it is the s.w. winds which bring the rain, the heaviest falls take place among the hills in the w. of the country; and in the w. where there are hills lying to the n.w., w., or s.w., the annual rainfall is about the minimum. The annual rainfall in Cornwall, Wales, Cumberland, and the w. Highlands is estimated at 45 to 65 inches. In some places, however, this amount is far exceeded. At Seathwaite, in Cumberland, for instance, the rainfall is truly tropical, the mean annual amount being 127 inches; in 1861, it was 182 inches; and in the month of Nov. of that year the enormous quantity of 35·41 inches fell at this station. At Tyndrum, in Perthshire, 134·5 inches fell in 1861; and at this place, and

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among the Arrochar Hills, the monthly rainfall is occasionally between 20 and 30 inches.

Natural History.—The natural history of G. B. corresponds generally with that of continental Europe (q.v.). Very few species, either of plants or animals, are peculiar to G. B. The flora of the greater part of the island most nearly resembles that of Germany; but in s. England there is, as might be expected, a closer correspondence with that of the n.w. of France; and some plants found in the Channel Islands and on the French coast appear nowhere in Britain but in the s.w. of England. The mountains of Wales, Cumberland, and Scotland have a vegetation resembling that of Scandinavia more than that of the mountains of central or southern Europe. The case is much the same as to the fauna. There are, however, many remarkable instances both of plants and animals, which, from these apparent relations to continental Europe, might be expected in G. B., yet are not indigenous to it; e.g. among plants, the Norway spruce, and, among animals, the lemming, both common in Scandinavia. The progress of civilization and of cultivation has completely banished from G. B. many animals formerly numerous; as, bears, wolves, etc. But on the contrary, many plants unquestionably introduced by man have become thoroughly naturalized.

Ethnology.—The present population of G. B. is the result of successive waves of immigration. When the Romans invaded Britain (B.C. 54), the inhabitants were Celtic, mixed with an earlier Euskarian (Basque) non-Aryan element; and they continued mainly so until the 5th and 6th c. when—the Romans having retired—the level parts of the country were gradually overrun by German tribes. Then followed invasions of Daves and other Scandinavian nations, and lastly the Norman Conquest. As the Normans, however, were originally from Scandinavia, they cannot be considered as adding any new ethnological element; so that the inhabitants of England (excepting Wales), and of the Lowlands of Scotland, may be considered as sprung from an amalgamation of the original Celtic with German and Scandinavian blood, the latter having predominated so as to determine the language, institutions, and character of the resulting race. Wales and the Highlands of Scotland are still inhabited by representatives of the ancient Celtic tribes. See WELSH LANGUAGE AND LITERATURE: SCOTLAND: PICTS: IRELAND: CELTIC NATIONS: BRITANNIA, ANGLO-SAXONS.

Notwithstanding the union of the two kingdoms into which the island was once divided, the distinction for certain purposes is still kept up. England (including Wales), the larger and southern division, extends as far n. as the parallel of $55^{\circ} 48'$, the boundary-line running between Berwick-on-Tweed and the Solway Firth (see BORDER, THE); greatest length is about 400, greatest breadth about 320 m.; about 58,300 sq. m. England resembles to some extent a triangle in shape, its s. shore forming the broad base, and its e. and w. coasts gradually approaching until the apex is reached at Berwick-on-Tweed. Scotland occupies the n.

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part of the island; greatest length (from the Mull of Galloway to Dunnet Head) about 287 m.; greatest breadth (from Peterhead to Ardnamurchan Point) about 182 m.; elsewhere, however, the breadth is much less. Between Alloa, on the Forth, and Dumbarton, on the Clyde, it is only 33 m.; between the head of Loch Broom, on the w. coast, and of Dornoch Firth on the e., only 26 m.; and n. of Inverness, the average breadth does not exceed 70 m. The entire area is about 31,000 sq. m. The greater part of the surface of Scotland is irregularly distributed into mountain and valley, a very small proportion spreading into level plains. The e. coast forms a waving, continuous, and rarely broken line; but the western is extremely irregular, being deeply indented with bays and arms of the sea, and exhibiting steep promontories and mountainous islands. The whole country is physically divided into *Highlands* and *Lowlands*—the former comprehending the n.w., w, and central portions; the latter, generally speaking, the e. coast and the country s. of the Forth and Clyde.

Islands.—The island of G. B. is surrounded by the Isle of Man, Anglesey, the Scilly Isles, the Isle of Wight, the outlying Channel Islands, the Shetland Isles, the Orkneys, and the Hebrides, each having generally a mainland encircled by small islands and rocks, bare or scantily covered, which sea-fowls inhabit, fishermen in their boats visit, and shepherds sometimes dwell in during summer. The coast against the North Sea has few islands, except Thanet, Sheppey, and some lowlands, isolated at high water. Coquet, Staples, Holy Island, May Island, Inchkeith, and Inchcolm, are the only ones inhabited. The Orkneys and the Shetlands lie to the north. St. Michael, Looe, and the Isle of Wight, are the only islands off the s. coast, except those sometimes connected with the land, and the Channel Islands off the coast of Normandy. All the other islands lie on the w. coast, extending from the Scilly Isles, through Anglesey and Man, to the Island of Lewis. According to the census of 1851, there were about 500 of these islands and rocks, of which only 175 were inhabited; but in 1861 a more careful enumeration was made, when it was ascertained that Scotland alone had 787, of which 186 were inhabited. The number belonging to England was not stated.

For administrative purposes, G. B., with its surrounding islands (excepting the Channel Islands and the Isle of Man, which are under peculiar jurisdiction), is divided into 64 counties or shires. The following tables exhibit their several areas and populations in 1871, in 1881, and in 1891 respectively:

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BRITISH EMPIRE.

Country.	Area in Square Miles.	Population in 1891.
Great Britain and Ireland	121,481	37,883,153
Gibraltar	2	24,467
Malta and Gozo	124	184,641
Europe.....	121,607	38,097,241
Cyprus.....	3,595	186,173
British India (including nat. states).....	1,430,962	278,032,550
Ceylon.....	24,702	3,008,239
Andaman and Nicobar Islands.....	3,192	21,170
Straits Settlements.....	1,472	568,000
Burma, Upper and Lower.....	156,142	7,555,410
N. Borneo.....	85,000	600,000
Hong Kong.....	50	215,800
Labuan Island.....	30	5,883
Aden. Kuria Muria Is., Perim & Mosha.....	92	41,944
Kamaran Island.....	64	.....
Keeling and Christmas Islands.....	48	516
Socotra Island.....	1,382	10,000
Malay Peninsula.....	24,660	357,000
Asia.....	1,731,371	290,602,685
Gambia.....	2,700	50,000
Sierra Leone.....	15,000	180,000
Gold Coast.....	46,600	1,905,000
Lagos and Yornba.....	21,070	3,000,000
Niger Districts, etc.....	290,000	17,000,000
Cape Colony and dependencies.....	233,430	1,700,000
Basutoland.....	9,720	180,000
Natal.....	21,150	540,000
Zulu and Tonga Lands.....	14,220	180,000
Bechuanaland.....	170,000	94,000
Zambezia, Nyassaland, etc.....	540,000	1,100,000
Zanzibar and Pemba.....	985,000	165,000
Ibea to 5° north latitude.....	245,000	5,600,000
Rest to Egyptian frontier.....	820,000	7,000,000
N. Somal Coast.....	30,000	210,000
Mauritius.....	1,053	390,000
St. Helena, Ascension, and Tristan..	126	5,000
Africa.....	2,461,054	39,329,000
Australia.....	2,946,153	3,043,921
Tasmania.....	26,375	146,667
New Zealand and dependencies.....	104,845	626,842
Fiji Islands, etc.....	8,045	124,919
New Guinea.....	88,460	489,000
Other Pacific Islands.....	461	9,200
Oceania.....	3,174,339	4,439,549
Dominion of Canada.....	3,315,647	4,832,679
Newfoundland.....	40,200	193,121
Labrador, E. coast of.....	120,000	4,211
Bermudas.....	19	15,743
Bahamas.....	4,466	49,500
Jamaica.....	4,192	639,491
Turk and Caicos Islands.....	169	4,778
Cayman Islands.....	225	3,066
British Honduras.....	8,291	27,668
West Indies.....	3,289	665,578
North America.....	3,496,498	6,435,835
Trinidad and Tobago.....	1,868	216,798
British Guiana.....	109,000	287,981
Falkland Islands.....	6,500	1,890
South Georgia Island.....	1,570	.....
South America.....	118,938	506,669
Total of British Empire.....	11,103,807	379,410,979

GREAT BRITAIN. ENGLAND.

Administrative Counties.	Area in sq. m.	Population, 1901.	Population, 1891.	Population, 1881.
Bedford.....	473.3	171,700	160,729	149,461
Berks	713.3	180,366	238,446	218,382
Buckingham.....	749.0	196,844	185,190	176,277
Cambridge.....	492.5	120,634	188,862	185,475
Chester.....	1,009.2	601,070	730,052	643,237
Cornwall.....	1,356.6	322,960	322,589	329,484
Cumberland.....	1,520.4	266,924	266,550	250,630
Derby	1,010.8	504,577	527,886	461,141
Devon	2,597.8	437,210	631,767	604,397
Dorset	977.4	202,092	191,487	190,979
Durham	1,001.1	833,614	1,016,449	867,536
Essex.....	1,523.2	816,503	785,399	575,930
Gloucester.....	1,236.8	331,516	599,974	572,480
Hereford.....	842.0	114,150	115,986	121,042
Hertford.....	632.0	258,045	220,125	202,900
Huntingdon.....	365.6	54,127	57,772	59,614
Isle of Ely.....	371.9	64,494	.....	.....
Isle of Wight.....	146.9	82,388	.....	.....
Kent.....	1,520.2	936,003	1,142,281	977,585
Lancaster.....	1,707.7	1,827,890	3,926,798	3,451,225
Leicester.....	819.1	225,896	373,693	321,018
Lincoln.....	2,604.2	388,038	472,778	469,994
London.....	117.0	4,536,063	.....	.....
Middlesex.....	232.3	792,225	3,251,703	2,918,814
Monmouth.....	539.5	230,800	252,260	211,374
Norfolk.....	2,036.7	313,438	456,471	444,825
Northampton.....	908.9	207,467	302,181	272,524
Northumberland.....	2,009.6	388,059	506,096	434,024
Nottingham.....	826.8	274,684	445,599	391,984
Oxford.....	743.7	137,118	185,938	179,650
Rutland.....	152.0	19,708	20,659	21,434
Salop.....	1,346.6	239,297	.....	.....
Soke of Peterborough	83.5	41,119	.....	.....
Somerset.....	1,615.8	385,060	484,326	469,010
Southampton.....	1,479.1	377,118	690,086	593,487
Stafford	1,128.2	879,618	1,083,273	981,385
Suffolk.....	1,469.8	306,687	369,351	356,863
Surrey.....	707.5	519,521	1,730,871	1,435,842
Sussex.....	1,445.9	781,212	550,442	49,316
Warwick.....	879.8	347,691	805,070	737,188
Westmoreland.....	789.6	64,411	66,098	68,184
Wilts.....	1,350.2	271,372	264,969	258,967
Worcester.....	739.7	358,356	413,755	380,291
York (East Riding)...	1,157.9	145,194	399,412	310,830
York (North Riding)...	2,124.5	285,671	368,237	346,147
York (West Riding)...	2,624.2	1,460,861	2,441,164	2,175,134
Total of England....	50,216.0	21,931,311	27,482,104	24,612,391

WALES.

Administrative Counties.	Area in sq. m.	Population, 1901.	Population, 1891.	Population, 1881.
Anglesey.....	276.0	50,590	50,079	50,964
Brecknock.....	733.3	54,211	57,031	57,725
Cardigan.....	692.3	61,076	62,506	70,226
Carmarthen	918.4	135,326	130,574	124,861
Carnarvon.....	571.8	125,669	118,225	119,195
Denbigh.....	665.7	131,588	117,950	108,931
Flint.....	254.7	81,490	77,189	80,373
Glamorgan	792.6	601,092	687,147	511,672
Merioneth.....	659.4	48,774	49,204	54,793
Montgomery	797.0	54,892	58,003	65,798
Pembroke	613.6	87,910	89,125	91,808
Radnor.....	470.6	23,263	21,791	23,539
Total of Wales.....	7,446.0	1,455,881	1,518,914	1,359,895

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SCOTLAND.

Counties.	Area in sq. m.	Population, 1901.	Population, 1891.	Population, 1881.
Aberdeen.....	1,972	304,439	281,331	267,963
Argyle.....	3,110	73,642	75,945	76,440
Ayr.....	1,132	254,468	221,222	217,504
Bauff.....	630	61,488	64,167	62,731
Berwick.....	457	30,824	32,398	35,333
Bute.....	218	18,787	18,408	17,666
Caithness.....	686	33,870	37,161	38,845
Clackmannan.....	55	32,029	28,433	25,677
Dumbarton.....	246	113,863	94,511	75,327
Dumfries.....	1,072	72,571	74,308	76,124
Edinburgh.....	366	488,796	444,055	388,977
Elgin or Moray.....	477	44,800	43,448	43,760
Fife.....	504	218,840	187,320	171,960
Forfar.....	874	284,082	277,788	266,374
Haddington.....	267	38,665	37,491	38,472
Inverness.....	4,211	90,104	88,362	90,414
Kincardine.....	381	40,923	35,647	31,430
Kinross.....	82	6,281	6,289	6,699
Kircudbright (Stew- artry).....	899	39,383	39,979	42,126
Lanark.....	879	1,339,327	1,045,787	904,405
Linlithgow.....	120	65,708	52,789	43,198
Nairn.....	162	9,291	10,019	10,454
Orkney and Shetland.	927	62,569	59,140	61,746
Peebles.....	348	15,066	14,760	13,819
Perth.....	2,491	123,283	126,128	128,985
Renfrewl.....	240	268,980	290,790	262,981
Ross and Cromarty..	3,089	76,450	77,751	78,539
Roxburgh.....	666	48,804	53,726	53,445
Selkirk.....	267	23,356	27,349	25,562
Stirling.....	451	142,291	125,604	112,437
Sutherland.....	2,028	21,440	21,940	23,365
Wigton.....	487	32,685	36,048	38,602
Total of Scotland...	29,796	4,472,103	4,033,103	3,734,441

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND is, since the union of Ireland, 1801, Jan. 1, the full official designation of the country generally known as Great Britain, Britain, or the United Kingdom. In addition to the home territories, G. B. possesses a multitude of dependencies.

The census of 1901 showed the following pop.: India (including native states) and Baluchistan, 294,361,056; British North America, 5,371,315; African (including Soudan) 42,440,000; and Australia, 3,771,715.

Agriculture.—In 1896 there were 47,756,000 acres under cultivation in the United Kingdom: 77 per cent. of the total area in England, 60 per cent. in Wales, 25 per cent. in Scotland, 72 per cent. in Ireland. The distribution of crops was: wheat, United Kingdom 1,731,876 acres: Great Britain 1,693,957, Ireland 37,919; barley, United Kingdom 2,277,778 acres: Great Britain 2,104,764, Ireland 173,014; oats, United Kingdom 4,289,092 acres: Great Britain 3,095,488, Ireland 1,193,604; beans, United Kingdom 252,253 acres: Great Britain 251,076, Ireland 1,177; peas, United Kingdom, 196,879: Great Britain 196,561, Ireland 318; potatoes, United Kingdom 1,269,393: Great Britain 563,741, Ireland 705,652; turnips, United Kingdom 2,191,612: Great Britain 1,883,118, Ireland 308,494; flax, Great Britain 1,-

GREAT BRITAIN.

CENSUSES OF THE UNITED KINGDOM, 1821-1901.

	Area in English sq. miles, 1891.	Population according to Census of		
		1821.	1831.	1841.
GREAT BRITAIN—				
England	50,823	11,281,883	12,090,523	15,002,443
Wales.....	7,363	718,353	806,274	911,705
Scotland.....	30,417	2,091,521	2,364,386	2,620,184
	88,603	14,081,762	16,261,183	18,534,332
IRELAND.....	32,583	6,801,827	7,767,401	8,175,124
ISLANDS—				
Guernsey, etc	50	20,827	6,128	28,521
Jersey.....	62	28,600	36,582	47,544
Man	220	40,081	41,000	47,975
Army, Navy, etc ...	....	307,790	277,017	216,079
Total.....	121,518	21,280,887	24,409,311	27,049,575

	Population according to Census of			
	1861.	1871.	1881.	1901.
GREAT BRITAIN—				
England	18,949,930	21,495,131	} 25,968,286	32,526,075
Wales.....	1,111,795	1,217,135		
Scotland.....	3,061,251	3,360,018	3,735,573	4,472,103
	23,122,976	26,072,284	29,703,859	36,998,178
IRELAND.....	5,792,055	5,411,416	5,174,836	4,458,775
ISLANDS.....				
Guernsey, etc.....	35,362	33,969	} 147,223	148,331
Jersey	56,078	56,627		
Man	52,339	54,042		
Army, Navy, etc....	275,900	229,000	242,844	.....
Total.....	23,334,710	31,857,338	35,262,762	41,607,552

796, Ireland, 72,301; hops, Great Britain 54,249; clover, etc., United Kingdom 5,915,597: Great Britain 4,595,937, Ireland 1,319,660; pasture, United Kingdom 27,941,915: Great Britain 16,726,476, Ireland 11,215,439. Total grain crops: United Kingdom 8,837,411 acres: Great Britain 7,416,690, Ireland 1,420,721; grand total cultivated and pasture lands 47,756,000: Great Britain 32,562,000, Ireland 15,197,000. The live stock comprised: horses, England 1,190,038, Scotland 206,504, Ireland 553,320, Wales 153,965, total 2,115,557; cattle, England 4,573,603, Wales 712,979, Scotland 1,207,000, Ireland 4,407,741, total 10,942,423; sheep, England 16,031,095, Wales 3,207,815, Scotland 7,466,419, Ireland 4,080,694, total 30,853,809; swine, England 2,476,488, Wales 257,698, Scotland 144,615, Ireland 1,405,508, total 4,301,338. The production of each of the principal crops in 1901 was as follows: wheat, Great Britain 52,458,000 bu., Ireland 1,470,000 bu., total 53,928,000 bu.; barley, Great Britain 61,108,000 bu., Ireland 6,536,000 bu., total 67,644,000 bush.; oats, Great Britain 110,106,000 bu., Ireland 51,069,000 bu., total 161,175,000 bu. The farming interests of the United Kingdom have

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suffered greatly in recent years from a succession of bad seasons, and the great advances in American competition. Some farmers were ruined, and many farms remained unlet. This naturally led to an enormous falling off in rents, to the extent 1880—81 of 20 to 50 per cent.

In 1901 there were in the United Kingdom 37,156,000 acres under crops and grass, while 23,412,000 acres consisted of grazing lands on hills and heaths. The live stock of Great Britain comprised 1,511,431 horses; 6,763,894 cattle; 26,397,200 sheep; and 2,179,925 pigs, and that in Ireland comprised 491,430 horses, 4,673,323 cattle; 4,278,750 sheep; and 1,219,135 pigs.

Fisheries.—The principal fisheries of the United Kingdom are those of salmon, herring, cod, haddock, turbot, soles, and other flat fish. The first is principally carried on in the estuaries and rivers of Scotland and Ireland; the second, principally on the coasts of the Scottish mainland and on adjacent islands. In these localities large quantities of herring are cured and exported. Cod and haddock are caught in great numbers in the North Sea, especially on the Dogger Bank. Among other fish procured in less quantity are pilchards, mackerel, oysters, and lobsters. In 1902 the fish production amounted to 903,101 tons, valued at £9,667,198. The number of men employed in this industry (1901) was about 104,118, and there were 25,797 registered boats.

For other great branches of industry, see IRON: PAPER: POTTERY: ETC.

Imports and Exports.—In 1901 the imports were £521,990,198; exports £347,864,268, comprising British produce £280,022,376; and foreign and colonial produce £67,841,892. Imports of gold coin and bullion (1890) were £20,715,628 against £26,190,873 in 1889; exports £30,123,925, against £21,369,323; imports of silver bullion and specie £14,329,116, against £10,669,662, and exports £15,048,134, against £10,357,436. Some of the heaviest imports of commodities in 1896 were: live animals £10,438,699; free food articles £146,301,708; tobacco £4,370,670; metals £20,464,786; textile materials £74,766,039; manufactured articles £81,250,453. The principal classes of exports were: articles of food and drink £11,355,141; raw materials £17,692,507; textile manufactures £105,353,592; metals and metal goods £33,572,894; machinery £17,036,899; apparel, etc., £10,473,345; chemicals and drugs £8,243,601; other manufactures £33,583,916. In 1901 imports from the United States were larger than from any other country, £141,015,465; exports to the United States (1901) were £18,393,883.

Gold and Silver Bullion and Specie.—The computed real value of the gold and silver bullion and specie brought into the United Kingdom (1858) was £29,493,190; (1859) £37,070,156; (1860) £22,978,196; (1861) £18,747,045. Of this quantity, Australia sent by far the most—viz., (1858) £9,066,289; (1859) £8,627,854; (1860) £6,719,857; (1861) £6,331,828. Mexico, S. America, and the W. Indies were the next largest exporters; then the United States and

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France. The exports from the United Kingdom during the same period were (1858) £19,628,876; (1859) £35,688,803; (1860) £25,634,768; (1861) £20,811,648. The declared real value of gold and silver bullion and specie imported into the United Kingdom during 1871 was—gold, £21,613,005; silver, £16,527,322; total, £38,140,327; exported—gold, £20,698,275; silver, £12,062,396; total, £33,760,671. The declared real value of such bullion and specie imported during 1901 was as follows—gold, £20,715,628; silver, £11,501,678; total, £32,217,306; exported—gold, £13,965,265; silver, £11,501,678; total, £25,466,943.

Shipping.—G. B. had, in 1861 (exclusive of river-steamers), 19,283 registered sailing-vessels, with an aggregate burden of 3,918,511 tons, and 997 steamers, carrying 441,184 tons; making together 20,285 vessels, of 4,359,695 tons burden, and employing, exclusive of masters, 171,957 seamen. The United Kingdom had in 1901 (exclusive of river steamers) 10,572 registered sailing vessels, with an aggregate burden of 1,990,627 tons, and 9,484 steamers, 7,617,793 tons, making 20,056 vessels of 9,608,420 tons burden and employing, exclusive of masters, 247,973 seamen. During same year there were built and registered for other countries 265 vessels, 194 of them steam, aggregating 207,452 tons. Total tonnage of vessels entering British ports in 1891 was 40,001,000 tons, and clearing 40,537,000 tons. Of this 73 per cent. was British. In the coast trade 323,616 vessels of 54,304,703 tons entered, and 289,310 vessels of 47,263,791 tons cleared. The total number of vessels that entered the ports of the United Kingdom was 381,330 of 94,396,394 tons; the number clearing was 350,006 of 87,801,274 tons. Of the foreign tonnage entered and cleared at ports of the United Kingdom 1895, Norway had 4,652,008, Germany 3,652,788, Holland 2,293,796, Sweden 1,960,571, Denmark 1,940,097, France 1,832,149, Spain 1,304,660, Belgium 1,082,445, the United States 650,161, Russia 615,153, Italy 297,466, Austria 196,701.

Railways.—The total length of lines open for traffic in the United Kingdom (1894) was 20,908 m. During the year 912,597,587 passengers travelled, of whom 29,821,010 were first-class, 60,161,714 second-class, 821,430,202 third-class, and 1,184,861 season and periodical ticket-holders. The amount of money derived from these travellers was: first-class, £2,965,730; second-class, £1,972,451; third-class, £23,276,224; season and periodical, £2,648,124; making a total for passenger traffic of £30,862,529. Conveyance of parcels, mails, etc., by passenger trains brought revenues of £5,632,959. Receipts from goods traffic were £43,379,078. The aggregate earnings were £84,310,831. The total amount invested in railway shares and loans was £985,387,355, on which the net earnings were £37,102,513. This is a rate of 3.77 per cent. on the total capital invested. Of this capital £102,329,459 was in guaranteed, £258,506,606 in debenture, £250,519,625 in preferential, and £360,086,684 in ordinary stocks and shares, besides £13,944,981 raised by loans. Of the total capital England furnished £811,814,000, Scotland £134,419,000, Ireland £39,387,000. Total ex-

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penditures for 1894 reached £47,208,313, which was 56 per cent. of the gross receipts. Of this £12,570,471 went for locomotive power, £3,968,275 for repairs and renewals of carriages, £7,561,637 for maintenance of permanent way, stations, etc., and £14,622,709 for traffic expenses. Total mileage of passenger and goods trains, 333,020,374 miles. During the year there were 16 passengers killed and 347 injured from accidents to trains, and 105 passengers killed and 1,143 injured from other causes. In 1901 there were 22,078 m. of line in operation, and 1,172,395,900 passengers were carried.

Revenue and Expenditure.—The income of the United Kingdom is derived from customs and excise duties, probate and legacy duties, stamps, land-tax, house duty, property and income tax, the post-office, the telegraph service, the hereditary revenues of the crown from woods, forests, and lands, and from a number of minor sources. The expenditure is classed under two heads: (1) the consolidated-fund services, or sums authorized by acts of parliament to be paid from the consolidated fund; (2) the supply services, which include payments for interest and management of the national debt, civil list and annuities to the royal family, and salaries and pensions. The financial year ends Mar. 1, and the chancellor of the exchequer soon afterward presents the 'budget,' which is the official statement of income, expenditure, and national indebtedness. Exchequer receipts 1901-2 were £142,997,999 (\$695,836,044), expenditures £195,522,215 (\$951,421,098); budget estimate for 1896-7: receipts £100,480,000 (\$488,499,270) expenditures £100,047,000 (\$488,450,605). Receipts in 1901-2 were: from customs £31,046,869, excise £31,597,962, stamps £7,772,423; land tax £775,219; house duty £1,726,676; property and income tax £35,378,700; post office £14,228,906; telegraph service £3,490,598; crown lands £439,378; interest on purchase-money Suez canal shares, etc., £869,634; miscellaneous £2,004,350. Expenditures were: national debt services £18,318,816; other consolidated-fund £1,643,790; total consolidated-fund services £24,483,214; in the supply services, army £92,262,000; navy £31,030,000; civil services £30,500,000; customs and inland revenue £2,955,000; post-office £9,240,000, telegraph service £4,010,000, packet service £762,000. Cost of the army was £15,308,600 for the regular army, £1,088,600 for the medical establishments, £2,772,000 for militia and other auxiliary forces, £20,266,000 for commissariat, £3,281,000 for buildings, £1,485,000 for pensions and rewards. Since 1842 revenue and expenditure have been, in million pounds sterling:

Period.	Revenue.	Expenditure.
1842-51	567	549
1852-61	678	709
1862-71	711	692
1872-81	799	794
1882-88	616	619
47 years	3,371	3,363

The increase in imports and exports has been as follows:

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Year.	Import.	Export.
1880	£411,200,000	£286,400,000
1887	362,200,000	280,800,000
1888	387,635,743	297,885,236
1890	420,692,000	338,253,000
1891	435,441,000	309,114,000
1892	423,794,000	291,640,000
1893	404,688,000	277,138,000
1894	408,345,000	273,786,000
1895	416,690,000	285,832,000
1896	441,807,000	296,389,000
1902	528,800,284	349,350,664

National Debt.—In 1902, Mar. 31, the national debt was £747,911,107 (\$3,529,035,446). The funded debt was £609,587,248, unfunded £75,133,000, terminable annuities £63,190,859, other liabilities £20,532,279.

Form of Government.—The government of G. B. is of the kind known as a ‘Constitutional Monarchy,’ in which the sovereign accepts of his dignity under an express agreement to abide by certain prescribed conditions: see **CORONATION OATH**. The sovereignty is hereditary in the family of Brunswick, now on the throne, and in the person of either a male or a female. The sovereign (king or queen) is the directing power in the executive of government; while the legislative function is exercised by parliament. For further information regarding the British constitution and laws, see **PARLIAMENT: MINISTRY: COMMON LAW, COURTS OF: JUDGES, ETC.**

Army and Navy.—The estimates for 1896–7 fixed the number of regular troops, exclusive of those serving in India, at 156,174. The effective strength of the regular army was fixed at 222,194 officers and men and 27,109 horses and mules. The reserves aggregated 80,100 officers and men, militia 140,104, yeomanry 11,678, volunteers 263,528, total home and colonial forces 642,515, soldiers in India 73,168; grand total 715,683. The navy 1897 consisted of 42 battle-ships, 23 port-defense ships, 273 cruisers, 59 torpedo-boats, 90 torpedo-boat destroyers; total, 487 vessels in commission. For later details, see **ARMIES, MODERN: NAVIES, MODERN:**

Money, Weights, and Measures: see **POUND: MINT: WEIGHTS AND MEASURES.**

Religion.—The United Kingdom is a Protestant state, but all religions—not offensive to public or private morals—may be professed, and their different forms of worship practiced, without interference from any quarter whatever. There are two churches ‘established’ by special acts of the legislature. In England, the established church is Episcopal in its government: see **ENGLAND, CHURCH OF**. In Scotland, the established church is Presbyterian: see **SCOTLAND, CHURCH OF**. In England and Wales there were (1896) about 14,000 parishes of the Church of England. In 1882 there were 14,573 registered churches and chapels in which marriages could be solemnized. In about one half the parishes the income is less than £130 a year. The gross income from ancient endowments (1896) was £5,469,171, of which £1,247,827 was from property vested in the ecclesiastical commissioners. The total annual income is estimated at £7,250,000. Large voluntary gifts are received for church work. In the 25 years 1860–85, £35,000,•

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000 was given for church buildings, £7,000,000 for home-mission work, £10,000,000 for foreign missions, £22,000,000 for elementary education, £4,000,000 for charitable work, and £2,000,000 for clerical charities, making a total of £80,000,000 (about \$400,000,000). There are two archbishops, 32 diocesan bishops, 90 archdeacons, 810 rural deacons, and (in 1891) clergymen of all grades actually doing service 24,232.

Among the Prot. dissenting bodies the most numerous membership is in the various sects of Methodists, including Old and New Connection, Primitive and Free Church, Bible Christians, Wesleyans, and others. These denominations possessed (1891) more than 15,200 chapels and numbered 801,000 members. The Independents or Congregationalists 1896 had 4,592 churches and preaching stations, containing 1,613,722 sittings; 2,804 ministers, of whom 633 were without charge; and 360,000 members. The Baptists (1891) had 3,809 chapels, 1,925 ministers, and 353,960 members, not including the families of the members and other adherents. There were 293 distinct religious denominations in 1895 registered with the registrar-general of births, deaths, and marriages. The census (1891) gave 10,057 Prot. dissenting ministers. The Roman Catholics in England and Wales were estimated at 1,500,000 in 1891.

In Scotland under the established church (Presb.) the country is divided into 16 synods, 84 presbyteries, and (1896) 1,363 parishes with 1,750 churches, chapels, and stations. The number of communicants (1894) was 620,376, and these raised £429,851 for home and missionary purposes. The entire endowments from all sources amount to probably not more than £300,000 a year. The church 1845-96 has erected and endowed churches for 399 new parishes at a cost of over £2,500,000.

The Free Church of Scotland had (1895) a total of 1,267 ministers and missionaries, 1,049 churches, 283,659 members, and 109,454 adherents. The population connected with the church was claimed to be 1,400,000. The income from all sources was £650,323. The aggregate funds raised from 1843-96 amount to £23,984,810. The United Presb. Church (1895) had 613 ministers, 578 churches, 41 home stations, 191,881 members, besides adherents, and an income of £410,853. The Episcopal Church in Scotland had (1896) seven bishops, 268 churches and missions, 266 clergy, and claimed the adherence of 80,000 people. The Rom. Cath. Church in Scotland had (1896) two archbishops, four bishops, a bishop-auxiliary, 404 priests, 349 churches, chapels, and stations. The number of adherents was estimated at 365,000.

In Ireland the Rom. Cath. Church is under four archbishops and 23 bishops. The Rom. Cath. population was returned (1891) at 3,547,307, which was 10.4 per cent less than in 1881. The (Prot. Episc.) Church of Ireland had (1897) two archbishops, 11 bishops, and 1,500 clergy. It had 1,450 churches with a membership representing 600,000 pop. Voluntary contributions were received (1895) to the value of £176,300. The census 1891 showed in Ireland,

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444,974 Presbyterians, 55,500 Methodists, 17,017 Independents, 5,111 Baptists, 3,032 Quakers, and 1,798 Jews.

Education.—In England, the chief institutions for education are the ancient national universities of Oxford and Cambridge; the more recent institutions of London, Durham, and Lampeter in Wales; the classical schools of Eton, Westminster, Winchester, Harrow, Charter-house, and Rugby; Owens College, Manchester, and other colleges and schools chiefly for physical science; the various military schools; the colleges of the dissenting denominations; the middle-class schools, started either by individual teachers, and hence called 'adventure' schools, or by associated bodies acting as directors, to whom the teachers are responsible; and the schools of design.

For primary education, a national system has now been established. Under the Elementary Education Act for England, 1870, a popularly elected school-board is established in any district where the existing schools are deficient. Schools under the act are supported by school rates and fees, and by parliamentary grants, varying according to the number of pupils and their proficiency as tested by different standards of examination. They are to be open at all times to government inspection. It is left to the discretion of school-boards to make education compulsory.

Scotland has four universities for the higher branches of education—Edinburgh, Glasgow, St. Andrews, and Aberdeen—besides a variety of minor colleges connected with the Episcopal, Free Church, and other non-established churches. The Scotch Education Act, 1872, is modelled after the English Act, but differs from it by enacting that a school-board is to be elected in *every* parish and burgh; by making it illegal for parents to omit educating their children, between 5 and 13, in reading, writing, and arithmetic; and by comprehending higher class schools. In 1901 there were in England and Wales 5,857 Board schools with an average attendance of 2,259,259 pupils, 11,731 nat. society schools with 1,882,184 pupils, 458 Wesleyan with 126,879 pupils, 1,053 Rom. Cath. with 257,383 pupils, 1,052 pupils British, undenominational and other schools with 215,926 pupils; total 20,151 schools and 4,741,431 pupils. In same year there were 66,149 certificated teachers, 34,716 asst. teachers, 28,002 pupil teachers. In Scotland (1901) there were 3,141 schools, of which 2,788 were public with average attendance 555,302 pupils. Private schools had 81,072 pupils, making total 636,374. In Ireland 8,692 schools were free.

History.—1707, May 1, during the reign of Queen Anne, the union of England and Scotland was formally accomplished. (For the previous history, see ENGLAND: SCOTLAND.) In Scotland, the terms at first excited the utmost dissatisfaction, and even indignation; but the progress of time has shown it to be one of the greatest blessings that either nation could have experienced. The last years of Queen Anne's reign were marked by the triumph of the Tory party, headed by Harley and St. John (Oxford and Bolingbroke), who kept up a constant intrigue with the

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Pretender, for the purpose of procuring his restoration. This treachery was defeated by the sudden death of her majesty in 1713. According to the Act of Settlement, she was succeeded by the Elector of Hanover, who took the title George I. The whigs then regained their ascendancy, and, under the guidance of Walpole (q.v.), now rising to eminence, at once proceeded to impeach the more important of the tory leaders. Other severities drove the more impatient of that party to attempt bringing in the Pretender by force of arms. In 1715, the Earl of Mar in Scotland, and the Earl of Derwentwater in England, raised the standard of rebellion; both efforts, however, proved abortive, and were speedily crushed. Five years later occurred the frightful financial catastrophe known as the South Sea Bubble, when the nation was saved from anarchy mainly by the exertions of Walpole. The latter now became premier and chancellor of the exchequer; and under him the commerce and manufactures of England continued steadily to advance, though little improvement was as yet perceptible either in Scotland or Ireland. George I. died 1727, and was succeeded by his son, George II. An attempt was again made by the tories to oust the whigs from power, but was frustrated by Walpole, who still continued the prime mover of public affairs. In 1739, after a peace of extraordinary duration, he was forced by popular clamor into a war with Spain, on account of some efforts made by that country to check an illicit trade carried on by British merchants in its American colonies. This war was feebly carried on, and ingloriously terminated; but the attention of England was speedily drawn toward the Austrian war of succession, in which it was involved through the anxiety of the king for his Hanoverian possessions, and the strong antipathy of the people to the French. Walpole, disapproving of the war, was driven from office 1743. George II. appeared on the field of battle himself, and at Dettingen proved himself a man of courage and spirit. But the success of the French at Fontenoy, 1745, paralyzed the efforts of England during the rest of the campaign; and 1748, after nine years' fighting, a peace was concluded at Aix-la-Chapelle, by which it was agreed that both nations should mutually restore their conquests, and go back to exactly the same condition as they were in before the war! Meanwhile, a second attempt had been made (1745-6), by Prince Charles Edward Stuart, to win back the throne of his ancestors. This attempt, known as the second rebellion, was crushed at Culloden (1746, Apr. 16), and shortly afterward a variety of important measures were passed by the imperial parliament relating to Scotland generally, and to the Highlands in particular, which had the effect, on the whole, both of conciliating the inhabitants, and of advancing their civilization. Now, after a long period of indolence and poverty, Scotland began to make progress toward that equality with England, in comfort and prosperity, which it has since attained.

In 1756 broke out the 'seven years' war,' in which Britain took the side of Frederick the Great against France, Austria, Russia, and Poland. It achieved no triumphs in Europe;

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on the contrary, it suffered a signal disgrace in the surrender of the Duke of Cumberland, with 40,000 men, in Hanover; but in India, Clive deprived the French of most of their possessions, while Wolfe, in the new world, conquered their colony of Canada. In the midst of this war, George II. died (1760), and was succeeded by his grandson, George III., whose reign proved the longest and one of the most eventful in British annals. At this time, the principal sec. of state was William Pitt, afterward the great Earl of Chatham; but the favor which George III. showed to the Earl of Bute, a feeble and narrow-minded tory nobleman, rendered it necessary for the former to retire from office. Spain now joined France against Britain, as Pitt had foreseen and foretold; but success was given to the arms of the latter, and at the peace, 1763, Britain was allowed to retain many of the most valuable colonial possessions of both her antagonists. These wars, however, largely increased the national debt.

George III. now showed himself anxious to destroy the influence of the great whig families who had brought in the dynasty to which he belonged. The nation took the alarm, and for some time was strongly disaffected toward its sovereign, who was believed to be wholly under the influence of his Scotch premier, the Earl of Bute. Popular indignation at last forced the latter to resign, 1763. His successor, Grenville, inaugurated his advancement to office by the prosecution for libel of Wilkes, the member for Aylesbury, who had made himself conspicuous by his attacks both on Bute and his royal master. The proceedings in this case lasted some years, and were attended with serious tumults, and a vehemence if not rancor of public feeling that indicated the magnitude of the prevailing discontent. During the administration of Grenville, too, the first attempt was made to tax the American colonies by the passing of the succeeding Stamp Act, 1765. Against this the colonies protested, and the whig ministry of Rockingham repealed it. This ministry, however, was of short duration, and was replaced by one formed by Pitt, now created Earl of Chatham. The necessity for an increase of the finances led to another attempt at American taxation; and an act for imposing duties on the imports of tea, glass, and colors was passed. This measure excited the most determined opposition among the colonists; and finally, 1775, war broke out between them and the mother-country, which lasted eight years, and in which the colonies were supported by France, Spain, and Holland. It resulted in the acknowledgment of their independence, and in the formation of the republic of the United States (1783). During almost the whole of this unhappy contest, the ministry of Lord North directed the policy of the country; and it was only the success of a vote for the conclusion of the war that forced them to resign, early in 1782. It was followed by the second Rockingham ministry, and that soon afterward by the Shelburne ministry, remarkable only for the appearance in it of the younger Pitt. The lukewarm whiggism of Lord Shelburne gave offense to Fox and other more advanced political think-

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ers; the result was a coalition of the Foxites with the followers of Lord North. This coalition, factions and unprincipled in the last degree, triumphed, and under the name of the coalition ministry, held the seals of office during 1783. Fox's *India Bill*, the purpose of which was virtually to transfer the government and patronage of India from the E. India Company to the house of commons, was the cause of its ruins. This bill was considered by the king to aim at fixing the ministry in power beyond the control of both himself and the people, and having induced the house of lords to reject it, he compelled the ministry to resign. Pitt was then appointed prime minister and chancellor of the exchequer: see PITT. In 1786 commenced the trial of Warren Hastings, who was impeached by the whig leaders, Fox, Burke, and Sheridan, but was ultimately acquitted. Meanwhile, the progress both of England and Scotland was unquestionable; manufactures increased, agriculture improved, and—especially in Scotland—an interest in the discussion of political and other questions of importance spread through the community, as is seen clearly in the poetry of Robert Burns. The French Revolution (1789) at first strengthened this interest, but the excesses of the reign of terror produced a decided reaction; and for many years all classes, at least all the so-called 'respectable classes,' were fanatically averse to the slightest innovation. In 1793, the ministry of Pitt, without any real cause, declared war against the French republic, in spite of the opposition of Fox and Sheridan. This contest lasted till the peace of Amiens 1801, and was, on the whole, very disastrous to G. B., except at sea, where the victories of Howe off Brest, Jervis off Cape St. Vincent, Duncan off Camperdown, and Nelson in Aboukir Bay, served to sustain the spirit of the nation. Other features of the time were the *threatened* invasion of Britain by the French, which called forth volunteer corps in every part of the island; the Irish rebellion, which, though assisted by a French force, proved a failure; and the trial and condemnation at Edinburgh of the popular reformers, Mure, Palmer, and others. Pitt, who had left office just before the peace of Amiens, was succeeded by Addington, who was compelled to renew the war with Bonaparte 1803, because of Bonaparte's evading the fulfilment of the conditions of that peace. Again, Bonaparte threatened to invade the country, and collected an immense flotilla at Boulogne, professedly for that purpose, 1803, but was completely kept in check by Nelson. The battle of Trafalgar 1805 nearly annihilated the navy of France and Spain. But on land, the arms of France were victorious; and the battle of Austerlitz (1805) broke up most effectually that coalition of continental powers against France which G. B. had fostered and formed. The shock of this disaster gave a death-blow to Pitt, who died in the beginning of 1806, and was followed to the grave in the autumn of the same year by his rival, Fox. The overthrow of Prussia at Jena and Auerstadt, and of Russia at Friedland, placed G. B. in a most perilous predicament. All the nations of Europe were compelled by Bonaparte to exclude British merchan-

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dise from their ports, and the island of G. B. itself was declared in a state of blockade. Secure, however, in the protection of her invincible navy, she bore up bravely against her terrible isolation, increased her intercourse with her own vast colonies, ruined the commerce of her enemies, and never ceased her efforts to undermine the influence of her great enemy on the continent. The first people that showed a tendency to revolt against the arrogant tyranny of Bonaparte were the Spaniards. G. B. at once offered to assist them with arms and money; and 1808 a force was landed in Portugal, under the command of Sir Arthur Wellesley, afterward Duke of Wellington. The war which ensued (the 'Peninsular war') lasted till 1814, and ended in the French being driven back in disorder into their own country at Toulouse. Meanwhile, ruin had overtaken the French army in Russia; Austria, Prussia, and Russia had combined with G. B. against Bonaparte; and 1814 the allies entered Paris, and the French emperor was forced to abdicate, and retire to Elba. His return 1815 once more threw Europe into agitation; but his power was finally shattered at Waterloo by Wellington and Blücher, and peace restored to Europe. The contest had cost Britain (which had to subsidize most of her allies) an enormous expense: see DEBT, NATIONAL.

Now that the long conflict between France and Europe was over, the thoughts of the people were turned again to the question of political reform. Four years of extraordinary mercantile depression, which followed the victory at Waterloo, partly resulting from bad harvests, and partly from G. B.'s having ceased to enjoy that monopoly of commerce which she had held during the war, had made the people discontented, and the shameful massacre of the Manchester operatives in St. Peter's Fields by the yeomanry 1819—commonly known as the Peterloo massacre—excited strong indignation; but a horror of anything revolutionary still possessed the upper and a large section of the middle classes, and severe measures were passed with a view to the suppression of discontent among the working-classes. In 1820 George III. died, and was succeeded by his eldest son, George IV. The trial of his consort, Queen Caroline, which occurred in the same year, shattered his popularity, never very great. The commercial reforms of Huskisson, supported by Canning, which marked the next two years, added immensely to the prosperity of G. B., and capital grew so abundant, that a vast number of joint-stock companies were formed, as a means of giving it a wider range. Many of their projects for traffic in remote countries were visionary and ended disastrously, involving in ruin (between 1825, Oct., and 1826, Feb.) 59 English provincial banks, and inflicting great misery on the working-classes. About the same time, the Irish Rom. Catholics began to clamor for emancipation from their civil disabilities. The older and more inflexible tories, still dominant in parliament, opposed it; but the intense determination of the Irish people, and the powerful eloquence of their champion, Daniel O'Connell, at last prevailed, and 1829

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the ministry of Wellington, yielding to the storm, itself proposed and carried the measure. In 1830, George IV. died, and was succeeded by his brother, William IV. The outburst of the July revolution in France quickened the paces of British reformers; the demand of the nation for an improvement in the parliamentary representation became very strong; and 1830, Nov., after an exclusion from office of nearly half a century, the whigs once more ascended into power 'on the breath of popular applause,' and the ministry of Earl Grey immortalized itself by passing the 'Reform Bill.' Another of its claims to the respect and gratitude of posterity was the abolition of slavery in the British colonies (1834). The reform of the English poor-law, and in the mode of electing municipal authorities in Scotland, also deserves mention; but in 1834 the whig ministry was dismissed by the sovereign. Sir Robert Peel now became premier, but the whigs were still a majority in the house, and Peel was compelled to resign. The Melbourne administration which followed carried several small though beneficial measures of reform, but failed to secure the attachment of the people. The lower classes were becoming radical and chartist, while the middle classes, contented with the political power which the Reform Bill had secured to them, were growing apathetic, and in many cases, from dread of the masses, were leaning toward toryism. In the midst of these perplexities, William IV. died, 1837, and was succeeded by his niece, Princess Victoria, the present ruler of the united empire. In 1841, the whig ministry succumbed to a vote of 'no confidence,' and Sir Robert Peel once more assumed the helm of state. The principles of free trade now began to be actively advocated; public opinion was leavened by the platform addresses of Richard Cobden and John Bright, until the prime minister himself was finally converted, and in 1846 carried, what he had long opposed, a measure for the abolition of the *Corn-laws* (q.v.). Three years before the abolition of the corn-laws, a great schism took place in the Established Church of Scotland, and led to the formation of a body calling itself the 'Free Church of Scotland' (q.v.). Other important incidents of this period were the Chinese and Afghan wars; the Chartist agitation, which reached its climax in the monster petition of 1848, got up by Feargus O'Connor and his friends; the series of failures in the potato-crop of Ireland, involving that country in terrible misery, and inundating G. B. with paupers. Sir Robert Peel was succeeded in the government of the country by Lord John Russell, who did not prove as popular a minister as was anticipated, and in 1855 the old tory party returned to power, headed by the Earl of Derby and Mr. Disraeli. It was, however, beaten on its budget, and forced to resign in less than a year, when its place was taken by the coalition cabinet of Lord Aberdeen. During the ministry of this nobleman the *Crimean war* began (1854); but, as Lord Aberdeen was considered somewhat pro-Russian in his likings, he was obliged to make way for Lord Palmerston 1855. Two years later (1857, May), the Indian Mutiny

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broke out, and the energies of the government were taxed to the utmost to suppress it, but were eventually completely successful, through the heroism of the British soldiery. From 1855-65 (except for a brief interval, when Lord Derby returned to office), the government was in the hands of Lord Palmerston. During this period England carried on a successful war against China, and the volunteer movement was begun. The American War of secession caused great distress among British operatives. In 1861, Prince Albert died. In 1866, Earl Derby was at the head of affairs: Britain was connected with America in that year by the submarine telegraph, and the Fenian insurrection occurred. The year 1867 was marked by the passing of a conservative Reform Bill, which added more than half-a-million electors to the constituency of G. B.; and by the expedition against Abyssinia, under Sir Robert Napier, which, in 1868, resulted in the destruction of Magdala, and death of King Theodore. During the government of Mr. Disraeli, who succeeded Lord Derby, Scotch and Irish Reform Bills were passed, and an act discontinuing public executions. In 1869, Mr. Disraeli having resigned, an act was passed by the liberal government under William E. Gladstone, for disestablishing the Irish Church. The years 1870 and 72 produced the Education Acts for England and Scotland. In 1873-4, the Ashanti (q.v.) war was carried on to a successful termination; and the latter year witnessed the establishment of a conservative government under Mr. Disraeli (who became Earl of Beaconsfield 1876). This administration was characterized by its tendencies toward 'imperialism,' and by what was spoken of as a spirited foreign policy during the unusually critical phase of the Eastern question, which was temporarily settled at the Berlin Congress 1878. The English premier and his foreign secretary were both members of the congress. Among the events of the period where the annexation of Fiji (1874) and of the Transvaal (1877); the proclamation of the queen as empress of India (1877); the bringing of Indian troops to Malta (1878); and the conditional convention with Turkey, which secured the right of administering government in Cyprus (1878). The tedious Afghan war was begun in the end of 1878; and the war with the Zulus, in which occurred the disaster at Isandhlwana, began and ended 1879. In home politics, the obstructions of Irish home rulers caused serious inconvenience. The latter years of this administration were a time of severe commercial depression. Parliament was dissolved early in 1880, when a general election returned a large liberal majority; the government resigned, and a new administration was formed by Gladstone. The extravagant proceedings of some of the Land League agitators in Ireland, accompanied by numerous cases of bloodshed and outrage, compelled parliament 1881 reluctantly to pass a Peace Preservation or Coercion Bill for Ireland. The measure conferred on the administration the power of imprisoning without trial persons reasonably suspected of crime; and under its authority the leaders of the Land League, including several Irish members of par-

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lament, were ultimately put in jail. Meanwhile, an Irish Land Act conferring unparalleled privileges on the Irish tenantry had been passed, in spite of much opposition, especially in the house of lords. This act enables tenants to have judicial rents fixed by courts created for the purpose, recognizes the tenant's right to sell his tenancy, and makes provision for advancing money to tenants willing to purchase their holdings. In the same year English troops were finally withdrawn from Afghanistan. With the Boers of the Transvaal, who had risen in arms, it was agreed that their territory should possess autonomy, but remain under British suzerainty. In 1882 the affairs of Ireland still mainly occupied parliament. A modification of parliamentary procedure was necessitated by the repeated and persistent obstruction of the Irish members; and government introduced a bill securing to a majority of the house of commons the right of closing a debate. The government released the chief political suspects imprisoned in 1881 (see FORSTER, WILLIAM EDWARD). The new Irish sec., Lord Frederick Cavendish, was assassinated on his first visit to Dublin. A new Prevention of Crime Bill seemed called for, as outrages still occurred; but a conciliatory measure was prepared dealing with arrears of rent, and designed to rescue poverty-stricken tenants from hardship. The short and brilliant military expedition to Egypt (q.v.) in 1882 involved the government in the task of reorganizing Egyptian political institutions. The chief events since have been the unfortunate Soudan campaign, the dynamite outrages of Irish-Americans, complications with Russia in relation to Afghanistan, the passing of the Franchise and Redistribution Acts, the unsuccessful revolts of the 'half-breeds' in Canada, the resignation of Mr. Gladstone and Lord Salisbury's accession to office, the general election (1885, Dec.), with Mr. Gladstone's subsequent return to power, his retirement and Lord Salisbury's return 1886, the defeat of Mr. Gladstone's home-rule for Ireland bill, 1886, the cession of Cyprus to G. B. by Turkey, the celebration of the 50th anniversary of Queen Victoria's accession to the throne, and the annexation of Zululand 1887, and the 'Parnellism and Crime' investigation 1888-9.

In 1890 Irish and domestic affairs chiefly marked the opening of parliament; during the year the island of Heligoland was ceded to Germany in return for African concessions, and the end of the year witnessed the fall of Parnell from power, owing to disreputable disclosures concerning his private character. The Bering Sea controversy and Australian federation were subjects uppermost in discussion 1891. The most important event of 1892 was the change in the govt. The queen's speech at the opening of parliament was formally approved in the house of lords; in the commons it was the means of testing the strength of the two main parties. The usual address of acceptance having been moved by the conservatives, Mr. Asquith, on behalf of the liberal opposition, moved an amendment declaring no confidence in the government. The amendment was adopted by a majority of 40, and on the following day Lord Salisbury tendered the

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resignation of the conservative ministry. In response to the royal summons, Mr. Gladstone submitted to the queen a list of cabinet officers for approval, and the new govt. was at once officially announced, Mr. Gladstone being lord privy seal. Early in 1893 Mr. Gladstone introduced a new home-rule bill, which evoked a debate remarkable for the absence of acrimony. The first practical step toward disendowment and disestablishment of the church in Wales was taken in Feb. by introduction of a bill suspending all appointments to bishoprics, dignities, and benefices in Wales, as well as the creation of new vested interests in churches. In Aug. the Bering Sea award was made public. In this month debate on the home-rule bill in the commons occupied more than 80 days, the measure passing its second reading by a majority of 34. It was rejected by the house of lords by a vote of 419 to 41. A great strike of 500,000 colliers was finally settled by judicious arbitration. One of the most memorable events of 1894 was the retirement of Mr. Gladstone, owing to failing eyesight and other infirmities. He was succeeded in the liberal leadership by Lord Rosebery, who duly announced that his policy would not be to give home rule precedence over other reforms. The anti-Parnellites, under the leadership of Justin McCarthy, acquiesced in the inevitable. The Manitoba school question was one of the agitations of 1895, as well as a reform in Canadian copyright laws. Disestablishment of the church in Wales was again attempted. In July, after a vote in the commons of censure on the govt., Lord Rosebery's ministry resigned, and Lord Salisbury was requested by the queen to form a cabinet. He accepted the premiership. Writs were issued for the election of a new parliament, and the returns showed: conservatives and liberal-unionists in alliance, 411; all others, 259; joint majority of conservatives and liberal-unionists, 152; the conservative majority over all others combined being 6. In accordance with a royal proclamation, June 20, 1897, was observed throughout the British realm as a day of thanksgiving for the completion of sixty years of the queen's reign, and following this several days were given to splendid pageantry and various kinds of celebration.

GREAT BRITAIN, ROYAL ARMS OF: heraldic device borne by the sovereigns of the United Kingdom of Great Britain and Ireland. The royal arms are borne by her majesty Queen Victoria, thus:

Almost before the earliest dawns of hereditary coat armor, the sovereigns of England, in common with various other monarchs of Christendom, adopted the lion as their device. Richard I., in his earliest seal, has two lions, which are borne counter-rampant; but in the latter part of his reign, the great seal of Cœur-de-Lion represents the three lions in pale and passant gardant, as they have been almost uniformly depicted since. In 1340, Edward III. assumed the title of king of France, and quartered the arms of France with those of England. Mary, on her marriage with Philip II., impaled the arms of Spain and England.

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James VI. of Scotland, succeeding to the throne of England, quartered the arms borne by the preceding sovereigns with those of Scotland and Ireland, the first and fourth quarters being France and England quartered as before,



Royal Arms of Great Britain.

Quarterly, first and fourth gu., three lions pass. gard. in pale, or, for England; second, or, a lion rampant within a double tressure flory counterflory gu., for Scotland; third, az. a harp or, stringed ar., for Ireland; all surrounded by the Garter.—*Crest*: Upon the royal helmet, the imperial crown proper, thereon a lion statant gardant or, imperially crowned, also proper.—*Supporters*: Dexter, a lion rampant gardant or, crowned as the crest. Sinister, a unicorn ar., armed, crined, and unguled or, gorged with a coronet composed of grosses pattée and fleurs-de-lis, a chain affixed thereto, also or.—*Motto*: 'Dieu et mon Droit' in compartment below the shield, with Union rose, shamrock and thistle on same stem.

the second quarter the lion rampant of Scotland, within the double tressure (see SCOTLAND, ARMS OF), and the third quarter the harp of Ireland (see IRELAND, ARMS OF). The royal arms were similarly borne by all the sovereigns of the House of Stuart till the reign of Anne, except that William III. bore over all the coat of Nassau on an escutcheon of pretense. After the legislative union with Scotland in the reign of Anne, England and Scotland impaled were placed in the first and fourth quarter, France in the second, and Ireland in the third. The accession of George I. displaced England and Scotland from the fourth quarter, to make way for the arms of his majesty's German dominions. On the union with Ireland, George III. laid aside the titular assumption of king of France, and abandoned the French ensigns. The arms of England were now made to occupy the first and fourth quarter, Scotland the second, and Ireland the third, while the German ensigns were relegated to an escutcheon of pretence. These last were finally abandoned on the severance of Hanover from the crown of Great Britain at the accession of Victoria 1837.

GREAT CIRCLE SAILING

From the union of the crowns of England and Scotland under James I., till the union of the kingdoms 1707, the royal arms were somewhat differently marshalled in Scotland, Scotland being allowed in all Scottish seals, ensigns, and arms to occupy the first and fourth quarter, and England the second, while the whole were ensigned with the crown of Scotland; but the Act of Union 1707 recognizes no royal ensigns but those of the United Kingdom, which are to be 'such as her majesty shall think fit;' and by 39 and 40 Geo. III. c. 67, on the union with Ireland, it was enacted that the armorial bearings of the United Kingdom 'shall be such as his majesty by his royal proclamation under the Great Seal of the United Kingdom shall be pleased to appoint.' The practice, which prevails to a certain extent in Scotland, of giving the precedence to the Scottish lion in the royal shield, is incorrect, though the error has been committed in several of the official seals of the kingdom.

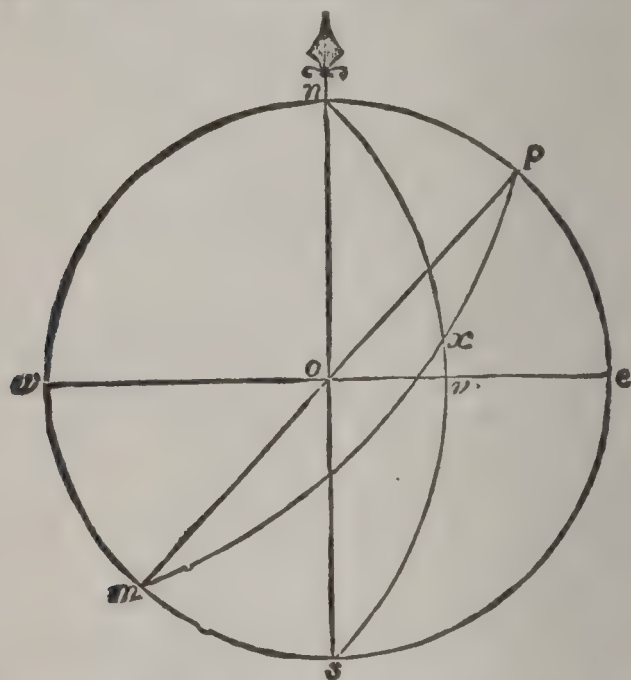
The lion passant as the *crest* of England first appears on the great seal of Edward III.

The *supporters* borne in former times by the kings of England varied much, particularly during the early period when these appendages of the shield were invested with more of a decorative than a heraldic character, and perhaps often left to the fancy of the engraver. When the arms of any of the English sovereigns from Richard II. to Edward IV. are represented with supporters, the animals selected are almost indifferently lions, antelopes, or white harts, and occasionally their place is supplied by angels. Edward IV.'s shield is sometimes supported on one side by a black bull, and Richard III.'s in one instance—in a ms. in the British Museum—on both sides by white boars. During the reigns of Henries VII. and VIII., Edward VI., Mary, and Elizabeth, the lion, red dragon, and greyhound were the supporters most in vogue, and as the herald or engraver had it not in his power to represent all three at once, he seems to have been allowed to select any two at pleasure. James I. for the first time clearly defined the royal supporters, adopting the lion of England and unicorn of Scotland as they have ever since been borne, the unicorn having been, till 1707, allowed the precedence in Scotland.

GREAT CIRCLE (or TANGENT) SAILING: navigation on a line coincident with a great circle of the earth. To have a clear idea of the advantages of G.C.S., it is necessary to remember that the shortest distance between two places on the earth's surface is along an arc of a great circle (see SPHERE); for instance, the shortest distance between two places in the same latitude is not along the parallel of latitude, but along an arc of a circle whose plane would pass through the two places and the centre of the earth. The problem, then, in G.C.S., is to determine what the course of a ship must be in order that it may coincide with a great circle of the earth, and thus render the distance sailed over the least possible. This problem may be solved in two ways. either by means of an instru-

GREAT CIRCLE SAILING.

ment called the 'spherograph,' or by the computation of a spherical triangle. For the first of these methods, see SPHEROGRAPH. The method by computation will be understood from the accompanying diagram: *nese* represents a meridian which passes through the place *p*, *nars* another meridian through the place *x*, and *pam* a portion of a great circle; let *p* be the place sailed from, and *x* the place sailed to, then *px* is the great circle track; and it is required to determine the length of *px* (called the distance), and the angle *xpe* which it makes with the meridian (called the course). To determine these two, we have three things: *nx*, the co latitude of *x*; *np*, the co-latitude of



p; and the angle *xnp*, which, measured along *ve*, gives the difference of longitude. The problem thus becomes a simple case of spherical trigonometry, the way of solving which may be found in any of the ordinary treatises on spherical trigonometry.

From the theory of G. C. S., the following most prominent features are at once deduced: *A ship sailing on a great circle makes straight for the port, and crosses the meridians at an angle which is always varying*, whereas, by other sailings, *the ship crosses all meridians at the same angle, or, in nautical phrase, her head is kept on the same point of the compass, and she never steers for the port direct till it is in sight*. As Mercator's chart (q.v.) 's the one used by navigators, and on it the course by the ordinary sailings is laid down as a straight line, it follows, from the previous observations, that the great circle track must be represented by a curve, and a little consideration will show that the latter must always lie in a higher latitude than the former. If the track is in the northern hemisphere, it lies nearer the north pole; if in the southern hemisphere, it is nearer the south pole. This explains how a curve-line on the chart represents a shorter track between two places than a straight line does; for the difference of latitude is the same for both tracks, and the great circle has the advantage of the shorter degrees

GREAT CIRCLE SAILING.

measured on the higher circles of latitude. Consequently, the higher the latitude is, the more do the tracks differ, especially if the two places are nearly on the same parallel. The *point of maximum separation*, as it is called, is that point in the great circle which is furthest from the rhumb-line on Mercator's chart. Since the errors of dead-reckoning (q.v. under DEAD) prevent a ship from being kept for any length of time on a prescribed track, and thus necessitate the calculation of a new path, in practice, the accurate projection of a great circle track on the chart would be a waste of time. In general, it is sufficient to lay down three points—the place sailed from, the place sailed to, and the point of maximum separation, and through these points to draw an arc of a circle. As the rhumb-line and great circle track between two places, one in north latitude and the other in south latitude, cross each other at the equator, in this case there will be two *points of maximum separation*, and the course and distance must be calculated for each side of the equator separately. Many ignorantly object to G. C. S. on the ground that, on account of constant change of bearings, a ship cannot be navigated on the correct course; but, in fact, all that is required of a navigator is to sail as near to his great circle track as convenient; and each separate course will be a tangent to his track, and the shorter these tangents are made, the more will the length of a voyage be diminished. A chart constructed on the *Gnomonic Projection* (q.v.) represents all great circle tracks as straight lines. See NAVIGATION.

GREAT EASTERN—GREAT MARLOW.

GREAT EASTERN: when built, largest ship afloat; designed by I. K. Brunel, and was launched at Mill-wall on the Thames, Eng., 1858. In 1860 the G. E. crossed the Atlantic to New York in 11 days. During the remainder of 1860, and the greater part of 1861, she made many voyages to and fro, but could not pay expenses and constantly required repairs. Her dimensions were: length, 680 ft. between perpendiculars, or 692 ft. upper deck; breadth, 83 ft., or 118 over paddle-boxes; height of hull, 60 ft., or 70 to top of bulwarks; bottom flat for 40 ft. in width, without keel. The propelling power comprised both paddle and screw. The paddle engines had 4 boilers, each with 400 brass flue-tubes; there were 4 engines, with cylinders of 14 ft. stroke. The screw engines had 6 boilers; the 4 engines had cylinders each 4 ft. stroke by 84 in. diameter, with piston-rods $7\frac{1}{2}$ in. thick; propeller-shaft 160 ft. long, with a screw propeller at one end 24 ft. in diameter. The coal-bunkers had a capacity of 14,000 tons. The engines combined were estimated to work up to 11,000 horse-power. There were 6 masts, 5 of them iron, carrying 7,000 yards of sail as auxiliary to the steam-power. The vast wall-sided compartments of the ship had facilities for conversion into cabins for 800 saloon passengers, 2,000 second-class, 1,200 third-class, and 400 officers and crew. From 1869 onward the G. E. found a good use in laying some of the most important telegraphic cables—across the Atlantic, in the Mediterranean, in the Red Sea, across the Indian Ocean, across the equator from Europe to Brazil, etc. In 1884 she became a coal-hulk at Gibraltar, and after being exhibited as a curiosity at different English ports was sold, 1888, at Liverpool to be broken up.

GREAT FISH RIVER: in Cape Colony stream in s. Africa; rising in the Snowy Mountains; and, after a generally s.e. course of 230 m., entering the Indian Ocean, lat. $33^{\circ} 25'$ s. and long. 27° e., having at its mouth a bar, which renders it inaccessible to any decked vessel.

GREAT FISH RIVER, or BACK'S RIVER: stream in British America entering an inlet of the Arctic Ocean in 95° w. long. after passing through Lake Pelly: SEE BACK, SIR GEORGE.

GREAT GRIMSBY. see GRIMSBY, GREAT.

GREAT KANAWHA, *ka-naw-wa*: affluent of the Ohio river, called New river in the upper part of its course. It rises in the n.w. of N. C. between Blue Ridge and Iron Mountain; flows n.e. more than 100 m. between parallel mountain ranges; then turning n. and w., breaks through several ridges of the Alleghanies, and continues n.w. to its junction with the Ohio at Point Pleasant after a course in all of abt. 400 m. About 100 m. from its mouth, where it is joined by the Gauley river, it takes the name G. K.; and 2 m. lower it has a picturesque fall of abt. 50 feet. It is navigable up to this fall.

GREAT MARLOW, *mâr'lô*: municipal borough in Buckinghamshire, England, on the n. bank of the Thames, 31 m. n.w. of London. The Thames is here crossed by a suspension-bridge (constructed 1835), which has a span of

GREAT PEDEE RIVER—GREAT SEAL.

225 ft. The principal manufactures are silk, lace, and paper. Pop. (1891) 5,265.

GREAT PEDEE RIVER, *grāt pē-dē' rīv'ér*: formed in N. C. by the Rocky and Yadkin rivers, flows s.s.e. into S. C., and enters Winyaw Bay in Georgetown co. The lower part of it is locally known by the name of one of its affluents, the Waccamaw, and its chief tributary is the Little Pedee, which also is formed by two streams in N. C. The G. P. is navigable for steamers to Gardner's Bluff, and sloops can ascend it 120 miles.

GREAT SALT LAKE: remarkable and extensive body of water, in the n. of Utah State; giving name to Salt Lake City (q.v.), the Mormon metropolis, which is 12 m. from its s.e. extremity. The lake lies in one of the great valleys or basins of the Rocky Mountains, and is about 70 m. long and 30 m. broad, yet its average depth is only seven or eight ft., and it nowhere exceeds a depth of 33 ft. Its surface is 4,200 ft. above sea-level. In the middle of the lake, several islands rise abt. 3,250 ft. above the level of the water; the principal island is in lat. 41° 10' n., and long. 112° 21' w. The islands are 9 in number, one is 12 m., another 16 m. in length. The water of the lake is so salt as to form one of the purest and most concentrated brines known in the world; and contains 22 per cent. of chloride of sodium, slightly mixed with other salts. It is refreshing to bathe in and singularly buoyant; but the swallowing of a mouthful causes strangulation, and a drop in the eye raises acute pain. Several species of insects and a crustacean (*Artemia*) have been found in its waters, but no fishes. Vast flocks of gulls, ducks, and geese frequent the shores. The country around is mostly very desolate. The lake receives from the s., by the Jordan, the waters of the Utah Lake, which are fresh, and those of the Wear river from the n.; but it has no outlet. In the quality of the water, and the wild desolate scenery around, it resembles the Dead Sea. The first mention of the G. S. L. was by La Hontan, 1689, who heard of it from the Indians. It was first explored and described, 1843, by Col. Fremont. A thorough survey was made 1849-50, by Capt. Howard Stansbury, U.S.A., whose report was printed 1852. See **SALT LAKE CITY: UTAH**.

GREAT SEAL: principal seal of a nation or of a state, on which is engraved some device formally adopted by the government (in a monarchy the effigy, style, and titles of the reigning sovereign)—an impression from which in wax on a document gives the document an official authority. By Act of Union between England and Scotland (5 Anne, c. 8), one Great Seal for the United Kingdom of Great Britain is used for sealing writs to summon the parliament, for treatises with foreign states, and all public acts of state affecting Great Britain: the holder of the Great Seal is now generally called the Lord Chancellor. A seal is also kept in Scotland for sealing grants and writs affecting private rights there. As regards Ireland, the Act of Union, 39 and 40 Geo. III. c. 67, provided that various acts as to

GREAT SLAVE LAKE—GREBE.

summoning parliament, etc., should be done under the Great Seal of the United Kingdom; but in other respects, the Great Seal of Ireland is used in the same manner as before the union.

GREAT SLAVE LAKE: extensive and irregular body of water in the Canadian n.w. territory; lat. $60^{\circ} 40'$ — 63° n., long. $109^{\circ} 30'$ — $117^{\circ} 30'$ w.; greatest length about 300 m., greatest breadth 50 m. It is surrounded, especially on the n., by rugged and precipitous shores; it contains many islands, some wooded, and is wholly frozen over for six months of every year. On the n. it receives the surplus waters of Lake Aylmar and Lake Artillery; and by the Slave river on the s., it receives the surplus waters of Lake Athabasca; and it discharges by the Mackenzie river into the Arctic Ocean.

GREAT SLAVE RIVER: in British N. America, the outlet from Lake Athabasca into Great Slave Lake, flowing in a n.w. direction from the former to the latter. It is about 210 m. in length; its banks in many parts are well wooded; and its course, which in the upper part is interrupted by falls and rapids, is through an alluvial region in the lower part.

GREAT WALL OF CHINA: see CHINESE EMPIRE.

GREAVE, n. *grēv*: in *OE.*, a grove, which see; a groove or depression in the earth.

GREAVES, n. plu. *grēvz* [Norm. F. *grève*, the shin or shinbone: Sp. *grevas*; OF. *greves*, boots, greaves]: pieces of armor formerly used as a defense for the legs. They were originally made of leather, quilted linen, etc.; afterward of steel, hollowed to fit the front of the legs, and fastened with straps behind.

GREAVES, n. *grāvz*: see GRAVES; the sediment of melted tallow; dog's food.

GREBE, n. *grēb* [F. *grèbe*; W. *crib*; Corn. *criban*, a comb, a crest]: name for various species (or, according to some writers, genera) of birds of the family *Podicipedidae*, having the feet webbed not in the usual manner, but by a separate membrane for each toe, united only at the base. Two genera, however, are generally conceded as sufficiently defined, *Podiceps* and *Centropelma*. The tarsi (shanks) are so much compressed as to be almost like blades. The claws are large and flat. The bill is about as long as the head, straight and conical. The wings are short. There is no tail. The legs are attached so far back that the birds when on land assume an erect



Head and Foot of Slavonian Grebe (*P. Cornutus*).

GRECIAN.

position, like penguins. They walk with difficulty, and all their motions on land are awkward. They sometimes shuffle along on their bellies like seals. But in water they are extremely agile; they swim rapidly, dive with extreme quickness if alarmed, and pass to very considerable distances under water, moving there by means of their feet alone, and threading their way with wonderful expertness among the stalks and leaves of aquatic plants. They feed on fishes, batrachians, crustaceans, and other aquatic animals, partly also on vegetable food. They are said sometimes to carry their young under their wings, and even to take them under water with them in diving to escape from enemies. The geographical distribution of the G. is very wide, and some of its species also are very widely distributed. The LITTLE G. (*P. minor*), called also DABCHICK or DOBCHICK, is the most common British species: it does not exceed ten inches in length. The Great-crested G. (*P. cristatus*), sometimes called the SATIN G. from the beautiful shining silvery feathers of the lower parts of its body, is in great request, the skin being used to make muffs for ladies or cut into narrow strips for trimming dresses. It has a wide range in Europe and America; it is known in parts of England as the Gaunt, or Loon. The Red-necked G. is of a size between the two above named; it is a native of sub-arctic parts of Europe and America. Writers who assign the G. into species, credit seven to N. America; of these only two are generally recognized as species differing from the European.—G-shooting is a favorite amusement on the Lake of Geneva; the G. is pursued by a boat, while it seeks to escape by diving and swimming under water. The males of some of the grebes have the head finely ornamented with tufts. The plumage of most of them varies much at different ages and seasons.

GRECIAN, a. *grē'shăn*: pertaining to Greece: N. a native of Greece; one versed in the Greek language. GRECIZE, v. *grē'sīz*, to translate into Greek; to render Grecian. GRE'CIZING, imp. GRE'CIZED, pp. *-sīzd*. GRE'CISM, n. *-sīzm*, a Greek idiom.

GRECIAN ARCHITECTURE.

GRECIAN ARCHITECTURE: architectural mode of classic Greece, embracing three styles (see COLUMN). Its origin, like the origin of every art and science in that country, is mixed with mythical and fabulous history. Each of its three styles has its mythical origin. Thus, the Doric is said to have been copied from the early wooden huts of the aborigines; the Ionic, which sprang up among the Greek colonists in Asia Minor, to have been modelled on the graceful proportions of the female figure, as the Doric had been on the more robust form of a man—the volutes representing the curls of the hair, the fluting the folds of the drapery, etc. The legend of the origin of the Corinthian style is pretty: a nurse had deposited, in a basket on the grave of a child, the toys with which the little one had amused herself. The basket was placed accidentally on the root of an acanthus, and in spring, when the leaves grew, they curled gracefully round the basket, and under a flat stone which was laid on the top of it. Callimachus, the sculptor, seeing it, caught the idea, and worked out at Corinth the beautiful capital since called after that city.

Modern discoveries have shown that Greece owed much to the earlier civilization of the countries which preceded it in history. To the architecture of one or other of these, almost every feature of G. A. can be traced. But it is for the first idea only that the Greeks are indebted to Egypt and Assyria; whatever forms they adopted, they so modified and improved as to make them part of their own architecture.

Doric.—This is the oldest style of G. A. The earliest example which remains is the temple at Corinth, built



Fig. 1.

about B.C. 650. The remains of this temple show the various members of the style fully developed, but they all are massive and heavy, strongly resembling in this respect their prototype, the architecture of Egypt. There is now no doubt, though the intermediate steps are lost, that the Doric style took its origin from the rock-cut tombs of Beni-Hassan (q.v.) in Egypt, of which fig. 1 is an existing example. The pillars of one of these tombs appear at first

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sight to be Doric; it is only on close inspection that we find that the echinus (q.v.) is lacking under the capital. The echinus was, however, used by the Egyptians. We here find ourselves at the cradle of G. A. This is the spot where we must seek for the origin of the style, not in Greece, where the earliest example is already complete in all its parts. The earlier the example, the more massive the form, disproving the theory that the pillars were copies of stems of trees used as posts. It seems more likely that the first pillars were square piers of rubble or brickwork, with a flat stone or tile laid on the top to form a good bed for the beams to rest on. These formed the architrave, stretching from pier to pier, on which rested the cross beams supporting the rafters of the roof, the ends of the latter suggesting the dentils and modillions (mutules) of the cornice, the former the triglyphs (see ENTABLATURE). The square form of the pier was afterward modified by cutting off the corners, and again cutting off the remaining corners, until the polygon suggested the fluted shaft. Similar was the process of the mediæval architects in developing the piers (q.v.) of Gothic architecture.

After the temple at Corinth, the next remaining example is the temple at Ægina (q.v.), built about a century later, B.C. 550. There may have been many temples of the same date, but no others remain; they were probably destroyed during the Persian war, or removed to make way for finer buildings during the great building epoch which succeeded that war, and when Greece was at the summit of power. Of this epoch, we have many remains. The temple of Theseus and the Parthenon at Athens (B.C. 438), that of Jupiter at Olympia (B.C. 440), Apollo Epicurius at Bassæ, Minerva at Sunium, and all the best examples of the Doric style of Greece, are of the age of Pericles. Besides the Peloponnesus, there are the countries colonized by the Greeks to which we can look for remains of G. A. The Dorian colonists of Sicily and Magna Græcia carried with them the architecture of their native country, and furnish many fine specimens. In Selinus are six temples, the oldest about the same age as that at Corinth. At Agrigentum are three Doric temples, one founded by Theron (B.C. 430); this is the largest Grecian temple of the period, 360 ft. long, 173 ft. broad. At Syracuse, Ægesta, and Pæstum are still seen many valuable examples.

As the Doric art progressed, the early massive forms gave place to more elegant and slender proportions. In the temple at Corinth the column is only 4.47 diameters in height; in the Parthenon (fig. 2), universally recognized as the finest example of the style, the column is 6.025 in height; and in later instances it becomes still taller and thinner, until it runs into the opposite extreme from which it started, and becomes so meagre and attenuated as to lose entirely the bold vigor of design which is the chief characteristic of the style.

The Doric style is admirable particularly for the beauty of the sculpture with which it is adorned, and the appropriate manner in which the sculpture is placed in the

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building, and the building suited for the sculpture. It has been shown by Penrose that every line was the subject of deep study on the part of the architect, for the purpose of correcting and allowing for all optical aberrations. The result is, that there is hardly a single straight line in the

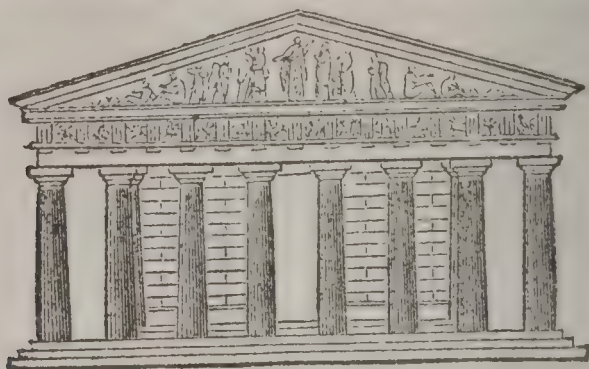


Fig. 2.

building; all the lines, which appear perfectly straight, are drawn with accurate curves, so as to produce the smoothest and most pleasing effect to the eye. Every harsh angle is softened, and every disagreeable combination of lines avoided. For example, the columns have an entasis (q.v.) or slight swelling form by a hyperbolic curve; the architrave of the front is curved upward, so as to correct the optical illusion caused by the sloping lines of the pediment, and the columns are sloped slightly inward, so as to give greater appearance of solidity. The Parthenon is built entirely of white marble, and the whole masonry in this, as in other Doric works of importance, is put together with perfect workmanship. There is no doubt that this and other Greek temples were adorned externally with color. To what extent this decoration was carried, is not ascertained; but it is probable that the exterior walls were covered with historical pictures, sheltered from the weather by the portico surrounding the temple. The sculpture also was probably relieved by a flat color on the background, and the moldings were decorated with painted or gilded ornaments.

Ionic.—This style took its rise about B.C. 500, and as the earlier Doric was imported from Egypt, so the Ionic seems to have originated from the influence of Assyrian art. The recent discoveries of Layard and others have shown that many of the characteristic ornaments of the style were in common use in Assyrian architecture. The volutes of the capitals are particularly indicative of an Eastern origin, the scroll being an ornament of very common use in all Eastern art. The finest examples of the Ionic style remaining in Greece are the temples of the Wingless Victory (*nikè apteros*) and the Erechtheum at Athens, built about B.C. 450–420. In the Ionian and other colonies of Asia Minor, also, many fine examples of this style were erected. The celebrated temple of Diana at Ephesus was of the Ionic order. It was the largest temple that we know of at its time, being 425 ft. long by 220 ft. wide. No trace of it remains.

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The Ionic is graceful and elegant, but not so pure and severe as the Doric. The latter is distinguished by simple and beautiful outline, enriched with perfect sculpture; the former trusts rather to ornamental carving for its effect.



Fig. 3.

This love of elaborate ornament is an indication of the Eastern influence under which the style originated, and the moldings and many of the ornaments are found to be identical with those of Assyrian architecture, only refined

and simplified by the Greeks. The honeysuckle ornament (fig. 3), so commonly used both in Assyrian and in Ionic architecture, is a good example of the improvement effected by the Greeks on the original type. In the Ionic as well as in the Doric, we find the most perfect execution and workmanship, the spirals, entasis, etc., being all drawn and cut with the greatest possible exactness.

Corinthian.--This style was the latest introduced, and combines, to some extent, the characteristics of both the preceding. It blends the Egyptian and Assyrian elements, the cap being probably derived from the bell-shaped capitals of the former country, ornamented with the carved leaves and spirals of the East. This order was used first about the time of Alexander the Great, the earliest example extant being the Choragic Monument (q.v.) of Lysicrates (B.C. 335). There are also the Temple of the Winds and that of Jupiter Olympius at Athens, the latter one of the largest and finest examples of the style. The Corinthian is the most florid of the Greek styles; and though invented by the Greeks, it was not brought into use till after the power of the republics, to whose period belong the finest works of Greek art, had begun to wane. This style, from its richness and splendor, became afterward the greatest favorite with the Romans, in whose hands Greek art became spread over the whole empire.

Caryatides.--Besides the above styles, which constitute the Greek orders of classic writers, the Greeks also used *Carytides* (q.v.), or female figures, in place of columns, as in the Erechtheum, and *Telamones* (q.v.), or giants, as at Angrigentum. These were probably derived from the figures used by the Egyptians in their architecture, though the latter never used them as columns; they always placed them as statues in front of the columns.

Greek temples are technically classed and designated by the mode in which the columns of the porticoes are arranged. The *cell*, or temple proper, is a square chamber contained within four walls; the simplest form of portico is called *distyle in antis* (fig 4), the two side walls being continued past the end-wall, and terminated with antæ, or pilasters, with two columns between. When the portico has four columns between the antæ, it is called tetrastyle. The temples have generally the same arrangement at both ends. In front of

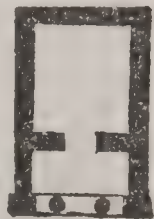


Fig. 4.

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both ends of the plan *distyle in antis* (fig. 5), there is frequently a range of six columns, and from the flank columns a row is continued along both sides. Such an arrangement is called *peripteral*, and the temple is designated hexastyle and peripteral: this was a common arrangement. The Parthenon is an exception to the general rule: it has a hexastyle portico at each end of the cell, in front of which is placed an octastyle portico, and seventeen columns at each side. The great temple at Agrigentum had seven columns at each end, and fourteen at each side; and was peculiar in having the space between the columns all round filled up with a wall. The reason probably was that the space between the columns was too great to be spanned by architraves in single stones. The wall was pierced with windows.

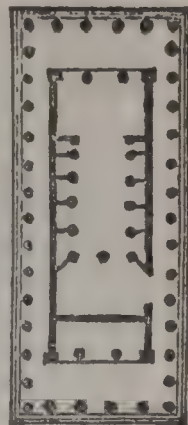


Fig. 5.

Considerable doubt has existed as to the mode adopted by the Greeks for lighting the interior of their temples; that suggested by Mr. Fergusson seems most probable, as being similar to the plan used by the Egyptians and Assyrians. The interior had generally a double row of columns, one over the other, dividing the width into three spans. This arrangement still exists in the temple of Neptune at Pæstum. Mr. Fergusson supposes that the light was introduced by counter-sinking a part of the roof, so as to admit the light between the pillars of the upper range, thus forming a kind of clerestory, as shown on the annexed

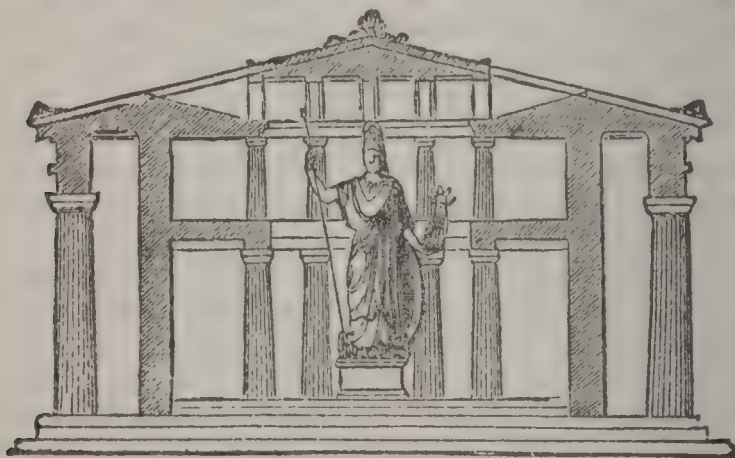


Fig. 6.

section of the Parthenon (fig. 6). Windows, however, also were used, as in the temple of Agrigentum and in the Erechtheum.

The theatres of the Greeks formed another very important class of works; they consisted of semi circular rows of seats cut in the rock or partly built. Remains of these structures are found in all the countries inhabited by the Greeks, and frequently of great size—that at Dramyssus being 443 ft. across. The proscenia were the parts on which architectural design was chiefly displayed; but all these have unfortunately perished.

GRECIAN GAMES—GREE.

None of the palaces or domestic edifices of the Greeks remain to us; we are thus totally deprived of a very interesting chapter in the history of domestic architecture, for it is highly probable that the streets and houses of Greece, though not so splendid and enduring as the temples, were more varied in style, and exhibited many picturesque and beautiful forms now entirely lost.

The attempt has been made in modern times to revive G. A., and some ingenious modifications and adaptations of it have been made. But it was found that this style, beautiful and appropriate in the warm and genial climate of Greece, was quite unsuited for northern latitudes. The porticoes are useless in a climate where external painting cannot last, and where the sunshine is courted rather than excluded; the pitch of the roof is not high enough to throw off snows; and windows of sufficient size for our dark skies are not admissible. G. A. has therefore been abandoned.

GRECIAN GAMES: see OLYMPIC GAMES: PYTHIAN GAMES: ISTHMUS.

GRECQUE, n. *grêk* [F. *fretwork*]: apparatus placed in coffee pots for holding the coffee-grounds. Hot water poured on the coffee, carries its strength and aroma through the perforated bottom, without the grounds; also a coffee-pot furnished with a grecque.

GREE, n. *grê* [Gael. *grith*, knowledge, pre-eminence]: in *Scot.*, pre-eminence; superiority.

GREE, n. *grê* [F. *gré*, will, inclination, taste—from It. *grato*, will, inclination—from mid. L. *gratum*, will, pleasure]: in *OE.*, goodwill; favor.

GREE, n. *grê* [L. *gradus*, a step]: in *OE.*, a degree; a step; a stair.

GREE, v. *grê*: an abbreviation of AGREE.

GREECE.

GREECE, *grēs.* kingdom in Europe; in the s. part of the most easterly peninsula on the n. shore of the Mediterranean. The name by which the ancient Greeks delighted to call their native country was Hellas (q v.). The terms Græcia and Græci were used first by the Romans, derived probably from a small tribe in Epirus, near Dodona, called *Graiikoi*, with whom the Romans may be supposed to have been, from proximity, best acquainted.

Extent, etc.—This country so celebrated in the history of freedom, of literature, of art, of philosophy, and of civilization generally, varied much in size at different periods of its history. Hellas at first denoted only a small district in Thessaly; later, it denoted not only the Morea and what is commonly called G. Proper, but also Macedonia, Epirus, and the islands of the Ægean.

Boundaries—(1) *Ancient.*—The n. limit of ancient G. may be fixed about the 40th parallel of n. lat., the s. extremity being in $36^{\circ} 23'$. The barrier separating G. from Illyricum and Macedonia on the n., was that range of mountains which, starting from the Adriatic as the Ceraunian range, merges into the Cambunian ridge in the centre, and runs out into the sea on the e. as the far-famed Olympus. The Ægean Sea washes the country on the e., the Mediterranean on the s., and the Ionian and Adriatic on the west. The greatest length is about 250 English m., greatest breadth 180. (2) *Modern.*—The n. boundary of the modern Greek kingdom was fixed 1834 by a line drawn from the Gulf of Arta (Ambracia) in the w., the Gulf of Volo (Pagasæ) in the east. The Berlin Congress 1878 recommended that Thessaly, s. of the Salambria river, and Epirus, s. of the Kalamas, should be restored to Greece. A less extensive cession was made by Turkey 1881. The new frontier gives Greece all Thessaly s. of the water-shed bounding on the n. the basin of the Salambria (anc. *Peneus*), and includes Larissa and Trikhala; in Epirus it runs along the Arta river, leaving Arta to Greece. The Gulf of Arta is neutralized. Before this addition of more than 5,000 sq. m. of territory, the area of the kingdom, including the islands, was 25,014 sq. miles.

Physical Conformation.—G. is essentially a country of mountains, hills, and valleys. From the ridge which forms its n. frontier, there starts in a southerly direction the Pindus chain, the backbone of G., dividing Thessaly from Epirus, and giving origin to those numerous streams which water the mainland. About lat. 39° , it sends off two spurs to the e.: Othrys (Gura), which terminates at the Gulf of Volo—and a little further s., Æta (Katavothra), at the extremity of which is the famous pass of Thermopylæ. Some ridges of less note run westward. From this point, the great central chain extends s. e. (though with many windings), as far as Mt. Cithæron, and even through Attica as far as Cape Sunium, under the names of Parnassus, Helicon, Cithæron, and Hymettus; while in a s. w. course are many ranges crossing the country toward the Ionian Sea and the Gulf of Corinth (Lepanto), in a direction parallel with, or slightly inclined to, that of the central chain. The somewhat lateral range of Cithæron and Parnes, on the borders

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of Attica, is extended through Megaris into the Morea or Peloponnesus by a lower ridge, which, passing across the Isthmus of Corinth, stretches to the w. coast. Of this range the two most conspicuous points are Mts. Cyllene and Erymanthus, from which two chains run s. on the east and west of Arcadia respectively, and under the names Taygetus (Pentedactylon) and Parnon (Malevó), terminate in the promontories of Tænarus and Malea. Beside these, there are many shorter chains and individual peaks. No country of Europe, except Switzerland and w. Scotland, can be compared to G. in the extent, variety, and irregularity of its mountain system, and the number and character of its valleys. Of all the divisions of G., Arcadia is most like Switzerland in its rugged nature and generally elevated surface. Some of the mountain peaks of G. rise to a great height; Olympus 9,700 English ft., covered with snow; Guiona, on the frontier, 8,249 ft.; Parnassus, 8,001; with many others of 7,000, 6,000, and 5,000. Helicon is 4,963; Cithæron, 4,630; Cyllene, 7,745; and the Acrocorinthus, or citadel of Corinth, is 1,869 ft. above sea-level. The mountains of G. are more remarkable for suddenness of rise than for great elevation. So there are many smaller peaks and cones notable for the abruptness with which they spring from the plain, such as the Acrocorinthus, the rock of Ithome, and the Meteora cliffs of Thessaly near the Pénæus. These last are huge masses of rock standing out from the plain to heights varying from 100 to 300 or 400 ft., with sides perpendicular as a wall. They assume the shapes of pillars, cones, and other figures more or less regular: they cover a space of nearly two sq. m., the recesses between the pinnacles being filled with trees and dense brushwood. The summits are occupied by monasteries, the only access to which is by baskets, nets, or ladders swung in the air.

Minerals.—G. is not rich in minerals: gold, silver, copper, lead, and iron are found, but the mines have never been worked with zeal. The most famous mines in ancient times were those of Laurium in Attica. Coal is found in Eubœa and in some parts of the Peloponnesus; salt is procured in many districts of G. and in the Ionian Islands; and marble of the purest kind, and of various colors, may be had in endless supply in almost all parts of Greece. The most famed quarries were in Paros, Carystus (in Eubœa), Pentelicus, and Hymettus. Marble and building-stone were quarried by the old Greeks to a very large extent. There are many mineral springs, both cold and warm, and many caverns still emit those mephitic exhalations which in bygone days quickened the imagination of the poet, and confirmed the superstition of the peasant.

Plains and Valleys.—The valleys of G. are very numerous, but owing to the great number and irregular courses of the mountain-ranges, are very small. The two great plains are those of Thessaly and Bœotia, the former being the largest and the most fertile in all G.: that of Messenia is both extensive and fertile.

Coast-line.—As Europe is pre-eminent among continents

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for the great extent of its sea-coast, so is G. for a similar feature remarkable among the kingdoms of Europe. The bays are very numerous, and many of them run far into the land, so that no part of the country is far from the sea—giving great facilities for maritime commerce.

Water-system.—(1) *Rivers.*—The Arachthus (modern Arta), now forming part of the n. frontier of G., rises in Pindus, and is navigable to the town of Arta. The Peneus (modern Salambria) is since 1881 again a Greek river. It also rises in the Pindus range, and receives several tributaries in the rich Thessalian plain, and after a course of about 100 m., falls into the Gulf of Salonica. The Archei (Aspropotamo) rises in Mount Pindus, flows s. through Epirus, and empties into the Ionian Sea, at the mouth of the Gulf of Corinth, after a course of about 130 m. The Spercheus rises in Pindus, and disembogues into the Malic Gulf. Besides these there are in north G. the Cephissus, rising in Doris, near the base of Mount Parnassus, and flowing through the fertile Bœotian plain into Lake Copais (Lago di Topoggia, or Lake of Livadia); and in the s. part of Bœotia, the Asopus (Vuriemi). In Peloponnesus, the principal streams are the Eurotas (Vasilipotamo) and the Alpheus (Roufia). By the banks of the Alpheus, the great Olympic games were celebrated. The rivers of G. depend for their supply mainly on the atmosphere; hence in summer the larger streams are greatly reduced in size, and the majority of the smaller ones are either almost or altogether dry channels. Many are nothing more than mountain torrents, or gulleys, which the heavy rains of autumn and winter fill for a short season.

(2) *Lakes.*—The many hill-encircled valleys of G., from which there is no outlet, afford favorable opportunity for the formation of lakes; hence the rains of autumn and winter stagnate in many cases, in the valleys of the mountains, and, for at least a part of the year, form tiny lakes or tarns. Some of these are permanent, though with great difference in depth of water, according to the season of the year; while others degenerate, in summer, into reed-grown marshes and pestilential fens. See BŒOTIA.

Climate.—The climate of G. varies considerably in different parts. In the highlands of the interior, the cold in winter is often severe, snow lying for several months. On the plains, and in the lower districts near the coast, snow is seldom seen; but the n. and n.w. winds are frequently very trying, though there is no intense cold. The summer heat is often excessive; and the sirocco frequently visits the south and lower parts. In moisture too there is much difference; thus, while Attica is remarkable for its pure air and beautifully bright sky, Bœotia has been famed from ancient times for the moisture of its climate and the fogginess of its atmosphere. The swampy valleys of Lake Copais and other marshy tracts, when acted on by the scorching heat of a summer's sun, produce those noxious vapors which in so many parts of G. breed malaria and disease. This trouble seems to have increased since classical times, either from the greater thinness of the

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population, and the consequent diminution of tillage, or other causes not easily reached. But drainage would be an easy matter in a country whose rock-formation is of so soft a character as that of Greece. Were its natural advantages aided by drainage and irrigation, G. might yet become one of the most healthful and most fertile countries of Europe.

Productions.—The more common productions of Greek soil in ancient times were wheat, barley, and other cereals; flax, wine, and oil, with fruits of various kinds. The figs of Attica were and still are famed for excellence of flavor. Forests anciently covered many of the hills, and supplied timber for domestic purposes and for ship-building; they are still extensive in some parts. The most important productions of modern G. are those mentioned above, with maize, rice, millet, currants, and silk. Honey is produced in great quantity on Hymettus, and in some parts of the Peloponnesus. The mulberry tree is largely grown for the silkworm; and on the n. and s. shores of the Gulf of Corinth, as well as in Arcadia and the w. coast of the Peloponnesus, the Corinthian grape or currant is extensively cultivated. Vines flourish in almost all parts, but the island of Santorin possesses the most famous vineyards, with the greatest variety of grapes, and furnishes a wine highly prized by the Russians. The olive grows wild over all parts of G.; when engrafted, it yields an excellent fruit, which the inhabitants pickle in large quantity as a staple article of food. The oil of the olive serves to supply light; and is used in cooking and for food, as we use butter. Cotton, madder, tobacco, and leguminous plants grow in considerable quantity. Fruit-trees are specially fertile; figs and apricots are plentiful, and of excellent quality; oranges, citrons, lemons, pomegranates, almonds, water-melons, gourds, and others of less note are widely spread, largely produced, and of excellent quality. In 1892, 26,800 acres were devoted to tobacco and cotton, 1,111,560 to grain crops, 336,000 to vines, 168,000 to currants, and 432,000 to olives.

Flora and Fauna.—The flora of G. resembles that of other countries of s. Europe. Among the tame animals of ancient G. were the horse, mule, ass, ox, sheep, goat, swine, dog. The swine supplied the favorite flesh meat. Of wild animals, were the wolf, bear, boar, and even lions at an early period. Sheep and goats are still very plentiful, and in fact constitute one of the most important sources of wealth to the Greeks. Oxen are much used for plowing, but milch cows are little prized and scarce. At the present day, the wolf, bear, lynx, wild-cat, boar, stag, roebuck, fox, jackal, badger, marten, and many other wild animals are found in the forests. Hares, snipes, wild-ducks, and other game are very abundant; eagles, vultures, hawks, owls, etc., are found in considerable numbers. The tortoise is very common, but the inhabitants have a great aversion to it.

Agriculture.—Agricultural implements are still as rude as in the days of the Peloponnesian war, or even of Her-

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lod; and this, added to the scarcity of plowing oxen, ruggedness of the country, general thinness of soil, and difficulty of tillage and irrigation, is enough to damp the ardor of even a more energetic population. The houses of the country-people are in most parts little better than mere hovels; and a large proportion of the arable land is untilled. The modes of tillage are most primitive; and thus, though nearly half the male population of G. is employed in agricultural labors, they make but slight impression on the general aspect of the country, and influence little the amount of exports; in fact, they do not produce enough grain to supply the population; and that, too, though a higher yield is given in many parts of G. than in Britain. Much labor, however, is bestowed on the cultivation of the olive, vine, mulberry, and fruit-trees. The greater part of the land belongs to the state; rent is paid in kind, and in a certain proportion (one-third) to the net produce. The proprietor is in many cases obliged to furnish the *metayer*, or tenant, with seed to sow the ground, and with oxen to plow and prepare it; and as the *metayer* has an interest in the farm for only one year, there is little encouragement for either landlord or tenant to expend largely in improvements—such as drainage, fences, clearing of the soil, and comfortable farmsteadings. The country, however, is better suited for a pastoral than an agricultural people. Arcadia is still the land of shepherds, as of old. The flocks are driven to the valleys near the coast in winter, and in April to the hills.

Manufactures.—Manufactures are few and unimportant. Cotton and woolen stuffs and some minor articles are made by the peasantry for domestic use. Ship-building is carried on at most of the seaports; and silks, gauze-stuffs, cutlery, hardware, earthenware, leather, saddlery, and such articles are made in small quantities in some principal towns, and especially on the islands. The Greeks have great skill in embroidering in silk, gold, and silver; also in sculpture, and in cutting of marble. Carpets are made in the island of Andro, and straw hats at Lifanto. The modern Greeks are not behind their great ancestors in the art of dyeing in bright colors.

Commerce.—Every circumstance tends to make the Greek a man of commerce. He is of a quick, active, versatile, and practical turn of mind, and possesses all those qualities which insure success in business. The bays and gulfs of the sea-indented shore allure him to the waters, while the strong currents and frequent squalls on his iron-bound coast soon render him an expert and fearless seaman. The islanders are thrown into a seafaring life even more than the people of the mainland. G. occupies a position in the Mediterranean which, for commercial advantages, cannot be surpassed. The exports of ancient times were of course mainly the produce of the soil, the trees, and the mines, and they remain so at the present day. Raw produce—as cotton, corn, currants, figs, and other fruit, tobacco, olive-oil, honey, wax, gum, *valonia* bark, silk, and sponge—are the most common. From

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w. Europe, manufactured goods of all kinds, and the produce of British colonies, are largely imported: while Turkey, from her provinces in Europe and in Asia, supplies coffee, rice, timber, drugs, and other articles of eastern growth. The Greek merchants speculate largely in the grain trade. The principal seaports are Syra, Piræus, Patras, and Nauplia; and the ports with which they trade most are Constantinople, Leghorn, Trieste, Palermo, and Smyrna. Mercantile navy of G. comprised (1901) 137 steamers, 115,530 tons; 927 sailing vessels, 183,877 tons; besides 6,000 coasting vessels. It is as agents and carriers specially that the Greek ship-owners are engaged: they are in fact the great commission agents and carriers of the Mediterranean. Greek merchants have now established themselves in London, Liverpool, Manchester, Glasgow, and other towns of the British empire, as well as in those of France and of Germany; and as they have greater facilities for collecting articles of commerce from the inland parts of their own and contiguous countries, besides, as they despise no sort of commission or merchandise, however small or insignificant, they now control almost the entire traffic of the Ottoman empire, of Persia, and of other eastern countries.

Internal Commerce.—One great drawback to the development of Grecian resources and the increase of a home commerce, is the miserable state of the internal communication. Without a considerable river, with not a single canal, and with less than 100 m. of road fit for a donkey-cart, in the whole territory, it is not wonderful that the inland inhabitants are devoid of energy and enterprise, and that they consume but little of the imports from abroad. Mules, asses, horses, and men carry on their backs, over rugged paths and through mountain-passes, the scanty supplies of foreign luxury for the Greek peasant. There is a railway from the Piræus to Athens. A canal through the Isthmus of Corinth was opened for traffic, 1893.

Political Divisions.—In ancient times, G. was divided into a great number of petty states, each consisting of at least a city and some portion of surrounding territory. There was no king ruling over the whole country, no federal union which embraced all the states, no common council or government. Amphictyonic leagues did exist at one period, and in later times the Achæan and Ætolian leagues were formed, with patriotic and national objects in view (see AMPHICTYONIC COUNCIL: ÆTOLIA: ACHAIA); but these applied to only a limited area, and were of only local operation; hence quarrels were constant, and G. wasted on internal struggles those energies and means which, if properly husbanded, united, and directed, might have raised her to the pinnacle of fame and prosperity in every department of human exertion. It was only while some monster danger threatened universal destruction that all united for the common good, as in the Persian invasions, and even then jealousies and selfish interests caused many to join with those who sought to ruin the fatherland. The divisions of ancient G., as laid down on maps, afford a very

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Imperfect idea of the political condition of the country, singly or relatively; but as they have been so long known to the world under certain names, it will be best to mention them as usually given. Starting at the s.e., was the triangularly shaped Attica, separated from Bœotia on the n. by the range of Citharon and Parnes; then Bœotia, Phocis. Doris, Locris, Ætolia, Acarnania, Epirus, Thessaly, and Eubœa; and in the Peloponnese, Argolis, Laconia, Messina, Elis, Achaia, and Arcadia, with Megaris, partly on the Isthmus of Corinth. Before the cession of Thessaly and Epirus, G. was divided into 13 nomarchies, subdivided into 59 eparchies, and these again into demarchies or cantons. Of the nomarchies there were in Hellas, or northern G., Attica and Bœotia, Phocis and Phthiotis, Acarnania and Ætolia: in the Peloponnesus, Argolis and Corinthia, Achaia and Elis, Arcadia, Messenia, Laconia: in the islands, Eubœa, the Cyclades, Corfu, Zante, Cephalonia. See ATTICA: BŒOTIA: EUBŒA: ETC.; and for Cyclades, see 'Islands' at end of this article.

Government.—In ancient G., each state managed its own affairs, and governments were of different kinds. In Homeric times, monarchy seems to have prevailed; but in later years, republics, aristocracies, and oligarchies almost entirely usurped the ruling power; factions were rife, and in many cases their contests led to a total disruption of the body-politic. The present constitution of G. was arranged by an assembly elected 1863, Dec., and was adopted 1864, Oct. 29. The whole legislative power is vested in the Boulé, or House of Representatives, the members of which are elected by manhood suffrage for four years. The elections take place by ballot, and the chamber must meet annually for not less than three nor more than six months. There must be an attendance of at least one half the members to give legality to the proceedings; and no bill can become law without the consent of an absolute majority of members. The assembly has no power to alter the constitution itself. The Chamber of Deputies meets, on ordinary occasions, on Nov. 1 (O.S.) of every year. The law of 1886 fixed the number of deputies at 150, instead of 245 as before. The executive is vested in the king and the ministers at the head of the following departments, who are responsible for the acts of the sovereign: Ministry of the Interior, Finance, Justice, Education and Ecclesiastical Affairs, War, Marine, and Foreign Affairs. There is also a deliberative council of state, whose members, not less than 15 nor more than 25, are named by the crown, and hold office two years. To this council must be sent all bills from the Chamber of Deputies, and they are to be returned with observations or amendments within ten days; but this term may be prolonged for 15 days more. If no report is then made, the deputies may pass the law and send it up to the king. The education of the people is undertaken at the public cost; offices of state and positions of distinction are open to all. (See titles of individual states and cities.)

Administration of Justice.—The supreme court of justice is called, as in Athens of old, the Areopagus. Besides this

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are four courts of appeal, 16 courts of primary jurisdiction, the court of assizes, and 175 justice-of-peace courts, with all the regular accompaniments of lawyers, juries, notaries, etc. There is a complete code or laws to meet all cases which may arise between man and man. Capital punishment is exigible for certain offenses, the guillotine being the instrument of execution. The most numerous class of felons are brigands and assassins. The Greek judges have a well-earned reputation for independence and strict uprightness.

Army and Navy.—In 1867, military service was made obligatory on all Greek subjects; but it was only in 1880 that this system was fairly introduced, the providing of substitutes and other evasions having been strictly prohibited. The total term of service is 30 years—3 years in the regular army, and 7 years in its reserve; 10 years in the militia (landwehr), and 10 years in its reserve. Thus every Greek from his 20th to his 50th year, shares in the defense of his country. Under the new organization Greece could raise in time of war about 200,000 men, 120,000 of whom belong to the regular army and its reserve, 50,000 to the militia, and 30,000 to the militia reserve. The nominal strength of the army (1902) was 1,898 officers and 20,206 men; total 22,104. Navy comprised 3 armored vessels; 19 torpedo craft; 21 vessels not armor-clad, including 2 cruisers, 12 gun-boats, and 3 revenue vessels; some miscellaneous craft; officers and men about 4,000.

Money, Weights, and Measures.—The unit of the monetary system is the drachma, now equivalent to the French franc. (See DRACHM: FRANC.) The unit of weight is the oke = about 2 lbs. 11 oz. avoirdupois; the common measure of length is the pique = 27 inches. A stremma of land is about one fourth of an English acre.

Finance.—1902, Jan. 1, the total debt was officially reported \$149,044,000, beside a floating debt \$33,830,514, and to these must be added the kingdom's portion of the Ottoman public debt and certain other dues to Turkey. Fully a third of the national expenditures is absorbed by the interest on the debt, and a fifth by the ministries of war and marine. The revenue 1902 was estimated \$23,621,671; expenditure \$23,621,680. The kingdom was started on borrowed money, the three great powers, England, France, and Russia having guaranteed a loan of \$11,580,000, partly to indemnify Turkey and other creditors of G., and partly to assist agriculture and manufactures in their early struggles.

Inhabitants (Ancient Greece).—Of the earliest inhabitants of ancient Greece we have no definite knowledge. The term *autochthones* (sprung from the soil itself—earth born), which the Greeks applied to themselves, means no more than this, that the people had been there from time immemorial, and that their descendants had not the means or the inclination to trace their origin any further back. At a very early period the population of G. was largely, if not entirely, composed of Pelasgians (q.v.). It is probable that the Hellenes were only a

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branch of this great Pelasgian stock, but possessing more energy of character, they gradually spread themselves over the greater part of G., and supplanted the language and institutions of the Pelasgi by their own: thus they became the ruling race, and gave their name to the country.—*Modern Greece*.—The population of modern G. is greatly mixed. In Ætolia, Acarnania, Thessaly, the greater part of Peloponnesus, and most of the islands, the descendants of the old Greeks are still predominant; but a very large admixture of Albanians (see ALBANIA) prevails in Attica, Bœotia, Phocis, and Argolis, with the islands of Spezzia, Salanis, Hydra, and Andro. The true Greek is easily recognized by his tall stature, slim body, aquiline nose, oval face, and mustache. Whiskers are not considered staid and respectable; the beard is worn only in mourning. The Greeks are uncommonly temperate both in eating and drinking, and in the indulgence of the passions generally; flesh is seldom eaten; the diet is principally vegetable. The Greeks are devotedly attached to their fatherland, and their love of liberty and independence is not less strong than in the days of Miltiades and Themistocles. Aristocracy is, in consequence, at a discount; and though they love and are loyal to a good ruler, yet they are easily roused into resistance by the infringement of their rights. Commercial bargains are the delight of the Greeks, and they often manage, it is said, to part with their wares at twice their value. This sharpness they practice against the Turks especially. The Greek women are not beautiful. Early marriages are common. Greek matrons take great pride, like Niobe of old, in a numerous and beautiful offspring. But many of the children are cut off in infancy by the fevers which prevail. Two peculiar branches of the Greek race are—the Mainotes (from a district called *Maina*) of the Peloponnesus, and the Palikars of the n. highlands. The former, who boast to be the descendants of the ancient Spartans, inhabit principally the mountain fastnesses of Taygetus, where for centuries they defied the power of the Turks. They resemble in their sturdy independence, feudal relations, robbing propensities, and other characteristics, the Highlanders of Scotland 150 years ago; but in recent times, education, intermixture with other races, and commerce have, to a great extent, removed their peculiarities. The Palikars, that is. *Braves*, originally belonged to the n. parts of G.; but when Thessaly and other portions were by treaty left in the hands of the Turks, these hardy mountaineers chose to leave their ancient homes and settle in the new kingdom, to establish which they had shed their blood. The red cap, the white shirt, and the golden jacket, mark them out even to the casual observer as a separate class. They go about armed, and attended by armed followers; their houses are fortresses and their servants form a little army. The islanders are almost all seamen or traders; they wear the red cap, a short jacket, and wide Turkish trousers. The Albanians form about a fourth of the population; they are a strong, hardy race, and engage in agricultural or other

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severe labor. They are the hewers of wood and drawers of water to the more wealthy. They speak a language little allied to Slavonic or Greek. The Wallachs are a nomad and pastoral race; they sleep on the hillsides with their flocks, which are guarded by ferocious dogs. There are large numbers of Maltese at Athens, and the Piræus especially. There are few settlers from w. Europe. The Bavarians who swarmed into G. on the accession of King Otho have almost all disappeared.

Religion.—See GREEK RELIGION (Ancient): GREEK CHURCH.

Education (Ancient).—The education of the ancient Greeks was more physical than mental. The *gymnasium* was that of the athlete, not that of the *didaskalos* or preceptor. Young children were, till about their sixth year, trained at home by women, but were then sent to the *didaskuleia*, or schools under the charge of private tutors or pædagogi. The duty of the pædagogus was rather to keep his wards from outward injury and bad companions, than to teach them the accomplishments of grammar (including reading, writing, and arithmetic), music, and gymnastics, the favorite subjects of study in those days. In later times, the more intelligent slaves were specially trained for the duties of the pædagogus.—*Modern.*—Education of all kinds, from the humblest school to the university, is free to all. All children between the ages of five and twelve years are required to attend school, but the law is not well enforced in the rural districts. There were (1892) 2,745 primary schools and 295 secondary schools, with 3,600 teachers, and nearly 140,000 pupils, of whom 22,000 were females. Of the army recruits 30 per cent. are illiterate, and 15 per cent. able to read only. Finally, there is the University of Athens, which possesses the four faculties of theology, philosophy, law, and medicine; the average number of graduates of the university is 440. The classic Greek language and literature are prominent among the subjects of study.

Language (Ancient).—The Greek language is a branch of that wide-spread family of tongues, usually called Indo-Germanic or Aryan. It prevailed not only in the different parts of G., but also in the numerous Greek colonies which fringed the shores of the Euxine and the Mediterranean. But it must not be supposed that it was of the same type at all periods of Greek history, or in all parts of G., even at the same time. The three great branches of the Greek tongue were: 1. The Æolic, the oldest form, and that which presents the greatest affinity to the Latin and other members of the Indo-Germanic stock. 2. The Doric, a highland dialect, delighting in broad and rough sounds; it was spoken in the mountains of Thessaly, whence it travelled southward, and on the migration of the Dorians, took possession of the Peloponnesus. 3. The Ionic, a soft and vocal language, delighting in vowel sounds, and avoiding the harsh combination of consonants; it was spoken principally by the people of Attica and the Ionian colonies in Asia Minor. From it was made, by a series of contractions and

modifications, that most perfect form of the Greek language, the *Attic*, which was neither so harsh and broad as the *Doric*, nor so soft and vocal as the *Ionic*. It was brought to the height of perfection by the poets, the philosophers, and the historians of G., whose writings still teach the world, and command its admiration. By the conquests of Alexander the Great, the Greek language soon spread over a large part of the then known world, but corruption at once set in—words of other languages were adopted into the Greek, foreign idioms were introduced, and the rigid syntax of the great Athenian writers was neglected, so that, in process of time, there arose a depraved form of speech, called the *Hellenistic*, varying in many essential points from its great parent. In this last form the books of the New Testament were written. The process of deterioration still went on till about the middle of the 18th c.; when at length the spirit of the Greek nation again arose, and amid other endeavors to revive the ancient glory of their race, an attempt was made, and is still being made, and with great success, to restore the purity of the language. This leads us to the *Language of Modern Greece*.—In different parts of Greece different languages are spoken according to the element which predominates in the population. Thus Turkish prevails in some districts, Albanian in others, Wallachian in others, and Bulgarian in others; but in the greater part of Greece proper, the language is *Romæic Greek*, or as it is now more usually and more properly called, *Neo-Hellenic*. This language bears a very close resemblance to the *Hellenic*, or *Classical Greek*; and in fact does not differ more, if so much, from the *Attic*, as the *Attic* differed from the *Doric*. Information on this subject must be sought in a grammar of the language. Great efforts have been made in recent years to purge the *Neo-Hellenic* of barbarisms and foreign terms, and it is now written with such purity, that good scholars in ancient Greek have little difficulty in understanding *Tricoupis's* history or an Athenian newspaper.

Literature (Ancient).—The literature of Greece offers a field of vast extent, for adequate view of which recourse must be had to a full treatise. Poetry seems to have been the earliest form of composition among the Greeks, as indeed it must of necessity be in all nations, for facility of recollection; hence *Memory* is called the *Mother of the Muses*. The earliest poems seem to have been hymns in honor of the gods; to these succeeded songs praising the glorious deeds of heroes; but the greatest poem of ancient times which has come down to us is the *Iliad* of Homer, detailing the events connected with the siege of Troy, and the warriors who took part in that famous expedition. The *Iliad* and *Odyssey* have been for many centuries known and admired by scholars throughout the western world. The remarkable popularity of the Homeric poems produced a host of imitators; and many poets endeavored to rival the fame of the 'blind old man,' by narrating in verse the after-fate and vicissitudes of the heroes who took part in the war of Troy, or by treating of subjects allied to that of the *Iliad*, and even of mythological fables. These were called the

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Cyclic poets; they were subsequent to Homer and Hesiod; their writings were put together in chronological order by some Alexandrine grammarians about B.C. 200. The Homeric period is closed by the name of Hesiod. Homer is supposed to have written about B.C. 900, and Hesiod about B.C. 850. Hesiod's most celebrated writings are the *Theogony*, the *Shield of Hercules*, and the *Works and Days*, an agricultural poem. Of his others, only small fragments are preserved. Epic poetry culminated in Homer, and with him and his contemporaries it subsides. Of lyric poetry, there were two schools—the Æolic in Asia Minor and adjacent islands, especially Lesbos, and the Doric in Peloponnesus and Sicily. Of the Æolic school, the earliest poet was Callinus (B.C. 700); after him came Archilochus, famed for his cutting satires in iambic verse: Tyrtaeus, and Simonides of Amorgos, who contests with Archilochus the honor of having invented iambic verse. Alcæus and Sappho (about B.C. 610) represent the Æolic school in its perfection. To Anacreon (about B.C. 520) have been attributed many pieces not considered genuine. Of the Doric or choral school, it may suffice to mention Aleman, Stesichorus, Arion, Simonides, Bacchylides, and greatest of all in every known variety of choral poetry, Pindar (q.v.) the Thebian (B.C. 522).

Greek literature reached its highest perfection in the tragedies of Æschylus (B.C. 525-456); Sophocles (B.C. 495-405); and Euripides (B.C. 480-406). The writers who endeavored to follow in the track of these three great masters were far inferior, and with them tragedy degenerated to the effeminacy of lyrical songs and rhetorical bombast.

Comedy, like tragedy, took its origin from the worship of Bacchus. The three great names of the old Attic comedy are Cratinus, Eupolis, and Aristophanes (B.C. 452-380). In middle comedy, we have the names of Antiphanes and Alexis; and in new comedy, Philemon and Menander.

History did not engage the attention of the Greeks till a comparatively late period. Mentioning only the names of Cadmus of Miletus, Pherecydes of Seyros, Hecataeus, and Charon of Lampsacus, we come to Herodotus, the Father of History—or, as he has been called, the Homer of History—who wrote about B.C. 440; Thucydides, about B.C. 430; and Xenophon, about B.C. 400. In later times, were Polybius (B.C. 204-122); Dionysius of Halicarnassus, about B.C. 20; Diodorus Siculus, contemporary of Julius and Augustus Cæsar; Plutarch; Appian (in time of Hadrian and Antoninus Pius); Arrian (time of Hadrian); and Dion Cassius. In geography, were Strabo and Pausanias. In satire, the palm is borne by Lucian (q.v.). In oratory, were Antiphon (b. B.C. 480), Andocides (B.C. 467), Lysias (B.C. 453), Isocrates (B.C. 436). Æschines, great rival of Demosthenes (B.C. 389), Hyperides; and last and greatest of all, Demosthenes (B.C. 385). For the philosophers, see PHILOSOPHY.

Literature (Modern).—The literature of modern G. is still in its infancy. No work of importance appeared previous to the revolution; but since the establishment of the king-

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From 1829, more life has been infused into the men of a literary bent. The names of the brothers Panagiotis and Alexander Soutsos are known to scholars in w. Europe and America. They have written dramas, love-songs, novels, lyrics, and a poem (by Alexander) in the style of Byron's *Childe Harold*, detailing the wanderings, sights, and adventures of a Greek in France and Italy. In most of these there is much merit, though few readers can fully appreciate the style and handling. Among dramatic writers. Neroulos, Rangavis, and Charmouzis hold foremost place. *Memoirs of Different Battles fought between the Greeks and Turks from 1820 to 1829*, by Perrævos, is a well written book. In grammar and lexicography, Bamvas, Gennadios, Scarlatto Byzantino, and others, have done good service to the cause of learning. But of all the Neo-Hellenic works yet published, the *History of the Greek Revolution* by Tricoupis is the most valuable—not only for statement and facts, but also for purity and elegance of style. Many newspapers and other periodicals, in Neo-Hellenic, are published at Athens, Constantinople, London, and elsewhere; but the expense of these literary efforts is in most cases borne by wealthy Greek merchants, now frequently met with in w. Europe. Many years of good government, of national industry and prosperity, will be requisite before G. can assume that position in the world of letters which the prestige of her name entitles her to anticipate.

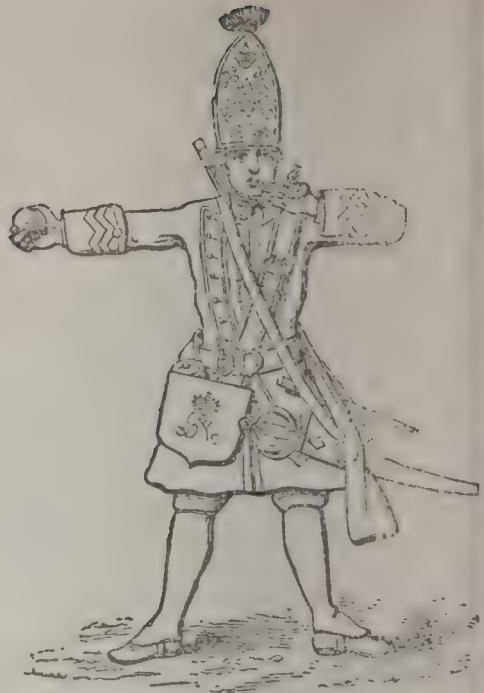
History (Ancient).—The early history of G. is lost in the mist of ages. The legends of gods and heroes, which constitute her only approach to history, are of that marvellous kind in which a superstitious and ignorant age delights. But how much truth may underlie the stories of Cecrops, Cadmus, Danaus, Theseus, Heracles, and many others, it is difficult to say; or to what extent the events of the Argonautic expedition, Trojan war, hunt of the Calydonian boar, and other joint-stock exploits, may be real, historians do not hope to discover. The heroic age is roughly estimated as B.C. 1400–1200, but all Greek chronology is mere guess until the first Olympiad, B.C. 776. There were migrations during these early days, and numerous colonies were planted by the Greeks; there were wars of the Spartans against the Messenians, which beginning B.C. 743, did not end until Ithome was destroyed in the third Messenian war, B.C. 455. Meantime, wars of less magnitude are carried on in different parts of Greece; Solon legislates at Athens (B.C. 594); Pisistratus and his sons hold the 'tyrannis' at Athens B.C. 560–510; Cræsus, King of Lydia, and Cyrus the Great, his conqueror, are brought into contact with the Asiatic Greeks (B.C. 560–542). And now, B.C. 499, the burning of Sardis by the Athenians and Ionians leads to those three memorable invasions of G. by the Persians which end so gloriously for G., and so disastrously for Persia. The first invasion under Mar-donius, B.C. 492, is averted by the shipwreck of the invading fleet off Mount Athos; the second, under Datis and Artaphernes, B.C. 490 is hurled back from Marathon; and the third, under Xerxes, B.C. 480, is utterly shattered at

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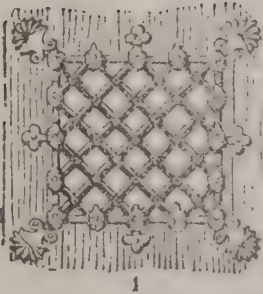
Thermopylæ, Salamis, and Plataea. G. is now a mighty name, but the Athenians become the ruling state, and their supremacy continues till B.C. 404. Meantime, disunion at home succeeds the contests with foreign enemies. The great Peloponnesian war begins B.C. 431, and wastes the energies of G. for 27 years, until the subjugation and partial demolition of Athens, B.C. 404, ended for a time the fratricidal struggle. It was B.C. 415, the 17th year of this war, that the famous and unfortunate expedition to Sicily took place. Under Pericles, the ruling spirit of Athens at the commencement of the war but who died of the great plague B.C. 429, the Athenians reached the highest point of excellence in sculpture and architecture; then were raised some of those wondrous buildings whose remains still excite the admiration of posterity at a distance of more than 2,000 years. B.C. 401 the expedition of Cyrus the Younger to dethrone his brother Artaxerxes, took place; the battle of Cunaxa, in which Cyrus was slain, was in the same year. Cyrus had employed Greek mercenaries, and this brief war is specially famed for the masterly retreat of the 10,000 Greeks under Xenophon the Athenian, B.C. 401-400. The next year (B.C. 399), Socrates the philosopher, teacher of Plato and Xenophon, was put to death. After the defeat of the Athenians in the Peloponnesian war, the Spartan state became the leading power in G., and was engaged in four wars in succession—1st, the Elean (B.C. 399-398); 2d, the Corinthian (B.C. 395-387); 3d, the Olynthian (B.C. 380-379); 4th, the Theban (B.C. 378-362). The great Spartan hero of these troublous times was Agesilaus, whose panegyric was written by Xenophon with a friendly pen. During these eventful years were fought the battles of Coronea and of Corinth (B.C. 394), Orchomenus (B.C. 375), Leuctra (B.C. 371), Mantinea, in which the Theban hero, Epaminondas, was slain (B.C. 362). B.C. 369 Philip ascends the throne of Macedonia and a few years afterward finds occasion to intermeddle in the affairs of Greece. Some of the allies of Athens renounce his supremacy, and thus arises the Social war (B.C. 357-355), in which Athens loses many of her tributaries, and much of her revenue. The Sacred war (B.C. 355-346) immediately follows, in which Philip takes part. About this time (B.C. 352), Demosthenes delivered the first of those powerful orations against Philip, called Philippics. In the battle of Chæroneia (B.C. 338), the Athenians and Thebans are utterly defeated by Philip; and at the congress of Corinth, in the following year, he is appointed generalissimo of the Greek forces against Persia. But the hand of the assassin cut him off at a marriage-feast in Macedonia; and after an unsuccessful revolt against his son Alexander, the Greeks, are compelled to bestow upon the youthful hero the same high military office with which they had intrusted his father. The events of Alexander's career are well known. From this time G. becomes an appanage of the Macedonian kingdom, until Macedon is in turn overcome by the Romans. During the wars which arose among the successors of Alexander G. was always the bone of



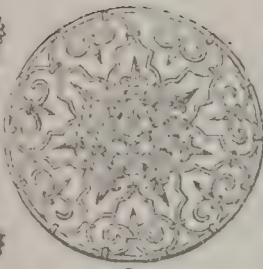
Groined Roof, Salisbury Cathedral.



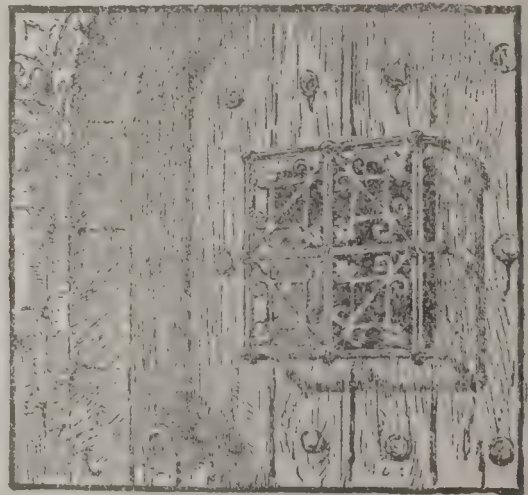
Grenadier of 1745. blowing his Fuse to light Grenade.



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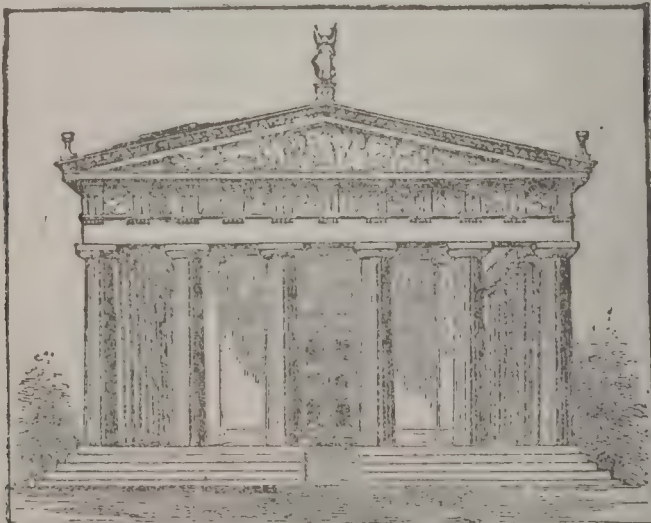


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1, Grille on door of English Convent, Bruges; 2, Grille, from Venice.

Grille.



Grecian.—Temple of Jupiter at Olympia: Doric Order.

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contention; she suffered in consequence many hardships, and had few intervals of peace. The last struggle for Grecian liberty was made by the Achæan League (a confederacy of cities at one time embracing all Peloponneses, which had a common object, a common council, and a common chief or *strategus*—see ACHAIA), but it too fell before the conquering arms of Rome; and after the capture of Corinth B.C. 146 by the consul Mummius, the once mighty G. became a province of the Roman empire.

History—(Modern).—The history of G. for some centuries after the capture of Corinth belongs to the history of her conqueror. The Roman wars with Antiochus Mithridates, and others, involved G. in countless hardships; and the fierce struggles of Cæsar and Pompey, of Brutus and Cassius with Antony and Octavianus, of Antony and Octavianus, of which G. was often the theatre, entailed on her many calamities. For nearly two centuries after the accession of Augustus, G. had comparative tranquillity, during which Christianity spread among her people, churches were founded, and many devoted Greeks went abroad to strange lands and imperilled their lives in the propagation of the Gospel of Christ. But dark days again awaited her, and successive inroads of Slavonians, Albanians, and other barbarous hordes, overran the country from the wintry plains of the north. When Constantine divided his empire, G. was attached to the eastern portion; but when, 1204, the Venetian fleet under Dandolo overpowered the rickety throne of the Cæsars, G. too changed masters. The Osman Turks, who migrated to Europe, 1355, and made themselves masters of Thrace, Macedonia, Thessaly, and other parts, captured Constantinople 1453; and from that time until recent years G. was subject to Mohammedan dominion. All the annoyances that ignorance, brutality, tyranny, and greed could suggest, were practiced by the Turks on the much enduring Greeks; but at length human nature could no longer endure, and in 1820 broke out that rebellion against Turkish rule, which, by the bravery and determination of the Greeks, and the friendly countenance of Christian Europe, ended in the establishment of G. as an independent kingdom 1829. Two unsuccessful attempts at rebellion had been made 1770 and 90. Capo d'Istrias, first president of liberated G., was assassinated 1831; and after several candidates for the throne of the infant kingdom had been proposed and rejected, Otho, second son of the king of Bavaria, was at length (1832) chosen by the three powers (Britain, France, Russia) which had assisted G. in her noble struggle. The reign of Otho was not peaceful, and he had serious difficulties to contend with after he had assumed the reins of government 1835. But his rule was not altogether devoid of fruit; and law and order, industry and commerce, literature and notions of self government, advanced. On the banishment of Otho 1862, the crown was offered to Prince Alfred of England. The agreement between the protecting powers, however, stood in the way of his election, and the present king, Georgias (George) I., son of Christian IX. of Den-

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mark, became king 1863. The Berlin Congress 1878 recommended the addition to Greece of the s. portions of Thessaly and Albania; this enlargement of territory was accomplished, with some modifications, 1881, after Turkey had refused to cede the entire area specified. War seemed at first likely to result from the disagreement; but ultimately was averted, through the efforts of the European powers, by the compromise to which the Greeks reluctantly assented.

In 1896, Apr., there broke out in Crete a revolt of the so-called "Christian," i.e., non-Mohammedan, population against Turkish rule. There were fierce battles, and numerous outrages were committed on both sides. Concessions offered by the Porte (Aug.) temporarily pacified the island; but as the Porte failed to carry these reforms into effect, the Cretans again rose in arms early in 1897. Greece promptly espoused their cause, and Prince George with a force of Greek troops landed on the island Feb. 12. Fearing that successful intervention by Greece in Crete might precipitate a general European war, or what was dreaded even more, a war of the united Mohammedan races of the Orient against the Christian nations, the great powers, in the interests of peace, took possession, Feb. 15, of Canea, and later of Retimo, Heraclion, and a few other points in Crete. On Mar. 21 a "pacific blockade" of the island was begun by war-ships of the Russian, British, French, German, and Italian fleets, to prevent either Greeks or Turks from landing troops or war material. Cretans attacking Turkish troops near these points were repeatedly shelled by the allied fleets.

In Greece an enthusiastic eagerness was developed for war with Turkey with the hope of not only annexing Crete, but of recovering Macedonia. To this sentiment the king and his government reluctantly yielded, and early in March the Greek reserves were called out, estimated at about 80,000 men, but lacking much in drill and equipment. The Turks hurried troops to Salonika, till by the end of March they had assembled on the Greek frontier 150,000 men, well armed and equipped, largely drilled, and in part commanded by German officers, the whole force being under command of the veteran general Edhem Pasha. Their artillery and rifles were greatly superior, not only in number, but also in effectiveness, to those of the Greeks. The great powers notified both nations that they would unite to prevent whichever country should be the aggressor from gaining any permanent increase of territory as the result of the war. Greece refrained from any official overt act, but on Apr. 9 a force of 1500 or more so-called "Greek irregulars"—brigands, organized and equipped by a Greek revolutionary society, the *Ethnike Hetairia* or National League—crossed the frontier of Macedonia, and soon came into collision with the Turkish outposts. The Turkish council of ministers decided Apr. 17 that in view of these incursions a state of war with Greece already existed, and on that evening Turkish troops attacked the Greek force at Nezeros, Turkey thus being technically the aggressor.

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Apr. 17-19, after a fierce struggle, the Turks secured possession of Milouna pass in the Olympian range, near Tyrnavo, the gateway to the great Thes-alian plain. The main Greek army was encamped 11 miles s. of Tyrnavo at Larissa, a considerable town commanding the plain. Apr. 23 an important pitched battle was fought at Mati, near the mouth of Milouna pass, which caused Crown Prince Constantine to order the immediate evacuation of Tyrnavo. The retreat took place at night, the frightened population encumbering the roads in the darkness with fugitives and household goods, till the retreat became a rout in panic and wild disorder. The next day (Apr. 24) the whole army retreated from Larissa to Volo and Pharsalos. Almost the entire population of the city (about 14,000) accompanied the retreat, destroying all semblance of military discipline, so that immense quantities of war material and supplies, including a large number of cannon, were abandoned to the enemy. On the 25th the Turkish forces occupied Larissa. Meanwhile in the west the Greek squadron in the Gulf of Arta had bombarded Prevesa, and the Greek army in Epirus, under command of Col. Manos, had achieved important successes, and was advancing on the city of Janina. But three days after the evacuation of Larissa this advance was suspended and the Turkish troops immediately assumed the offensive. After the retreat from Larissa the Greek cause was at once seen to be hopeless and the way to Athens practically open to the invaders. Excitement in Athens became intense. The Delyannis ministry was forced from power, and a new cabinet was formed (Apr. 30) headed by Demetrius Ralli. The Turks made (Apr. 30-May 2) several ineffectual attacks on Velesino, where the fighting was very severe. On May 5 the Greeks were driven from several positions near Pharsalos, and on the evening of the same day that city and Volo were abandoned, and the Greek army concentrated at Domoko. About the same time the Greek forces in Epirus were driven back across the border. The Greek fleet, composed of efficient modern war-vessels, to which the Turks had practically nothing to oppose, took no part in the conflict on the east except as inactive spectators at Volo.

On May 11 the powers presented to the Greek govt. a joint offer of mediation which was accepted. On May 13 the powers sent to the Porte a collective memorandum seeking an armistice. Hostilities, however, still continued, and on the 17th the Turks after severe fighting captured Domoko. On the 18th a preliminary armistice was concluded. The Turks proceeded to harvest the crops in Thessaly, and to establish there local Turkish governors and laws. May 20 the Greek troops were withdrawn from Crete. On June 3 the ambassadors of Turkey and of the great powers met as peace negotiators at Constantinople. The terms at first proposed by Turkey were the cession of Thessaly, the payment of a war indemnity of \$20,000,000, and the revocation of the special privileges enjoyed by Greeks resident in the Turkish dominions. The powers promptly decided against any dismemberment of Greece

or the requirement of a crushing indemnity. In July terms were settled of autonomy for Crete under a Christian governor acceptable to the Sultan as suzerain, with a legislature composed of Christians and Mussulmans according to their numerical strength, a tribute of \$50,000 annually to be paid to Turkey, to begin five years after the autonomy is established, the Greek to be the official language, and Crete to have a flag of her own. M. Numa Droz, ex-president of the Swiss executive, was appointed governor.

The commission decided that Thessaly should be restored to Greece, Turkey to be granted a certain extension of her frontier involving military advantages, and to evacuate the rest of the province within 30 days after the conclusion of the treaty of peace; the war indemnity to be reduced to a moderate sum.

The Islands.—The islands of the Ægean Sea are in two groups—the Cyclades and the Sporades. The Cyclades were so called from the legend of their *circling* round Delos at the birth of Diana and Apollo. The Sporades received their name from their being *scattered* or *sown* in an irregular manner round the coasts of the adjoining countries; they belong mostly to Turkey. The following list contains the islands belonging to G.; the first twenty are the Cyclades, the others, part of the Northern Sporades, lie off Eubœa; the Italian names are in parentheses. The Ionian Islands, formerly a republican dependency of Great Britain, were annexed to Greece 1864.

1. Delos with Rhenea (Dili); 2. Syros (Syra); 3. Myconos (Mycono); 4. Tenos (Tino); 5. Naxos (Naxia); 6. Andros (Andro); 7. Ceos (Zea); 8. Cythnos (Thermia); 9. Seriphos (Serpho); 10. Siphnos (Siphanto); 11. Cimolos (Argentiera); 12. Melos (Milo); 13. Pholegandros (Polican-dro); 14. Sicinos (Sicino); 15. Ios (Nio); 16. Thera (Santorin); 17. Anaphe (Nanfio); 18. Amorgos (Amorgo); 19. Paros (Paro); 20. OIiaros or Antiparos (Antiparo); 21. Scyros (Scyro); 22. Sciathos (Sciatho); 23. Scopelos (Scope-lo); 24. Icos (Chiliodromia). Besides these, there are many smaller islands and barren rocks, which belong to G., but are unimportant. The Greek islands possess many of the features which mark the mainland: the climate is varied; the soil is in one fruitful, in another barren; the productions are the same as in G., except that in some of them, as in Santorin, the vine grows in greater variety and luxuriance; the population is more primitive, and less mixed, and consequently retain more pertinaciously the customs of their forefathers. The islanders are generally more industrious and more happy than the continentals—the sea is their highway, and they can more easily get a market for the fruit of their industry. The islanders are excellent seamen, and a very large proportion of the men are employed in navigation. Delos is now little more than a barren rock; and scarce a vestige remains of the temple of the Sun-god, or other memorial of its former religious and commercial pre-eminence.

Syra, in the island of Syra, is one of the principal ports of G., and a great centre of trade.

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The people of Tenos are notable for the manufacture of marble tables, chimney-pieces, etc., which are largely exported; and the finest Malvasian or Malmsey wine is produced in the island. Of the other islands, the most volcanic is Thera; it produces in large quantity the wine called *Vino Santo*, or Santorin, of which the Russians are specially fond. Naxos is the largest, most beautiful, and most fertile of the Cyclades. These islands comprise an area of a little more than 1,000 sq. m.; pop. (1879) 132,020. The Cyclades are generally high and rocky in their coasts, and all are of very similar aspect in this and other regards. By the law of 1899, July 17, the kingdom was divided into 26 nomarchies, and these in turn subdivided into 69 districts and 442 communes. The area and pop. of G. by the census of 1896 were as follows:

Nomarchies.	Area in Eng. sq. miles.	Population.
NORTHERN GREECE—		
Attica and Bœotia	2,472	313,069
Phocis and Phthiotis.....	2,044	147,297
Acarnania and Ætolia.....	3,013	170,565
PELOPONNESUS—		
Argolis and Corinth.....	1,442	157,578
Achaia and Elis	1,901	236,251
Arcadia.....	2,020	167,092
Messenia.....	1,221	205,798
Laconia.....	1,679	135,462
ISLANDS—		
Eubœa and Sporades.....	2,216	115,515
Cyclades	923	134,747
Corfu.....	431	124,578
Zanthe (Zahynthos).....	277	45,032
Cephalonia (Kephallonia)	302	83,363
THESSALY—		
Arta	395	89,144
Trikalla	2,200	176,773
Larissa	2,478	181,542
Total	25,541	2,433,806

GREED, n. *grēd*: see under **GREEDY**.

GREEDY, a. *grē'dī* [AS. *grædig*; Dan. *graadig*, greedy; Goth. *gredags*, crying for food, hungry; Skr. *gridhnu*, greedy—from *gridh*, to be greedy]: ravenous; voracious; having a keen appetite for food or drink, or for anything desired; vehemently desirous. **GREEDILY**, ad. *-lī*, in a greedy manner; eagerly; ravenously. **GREEDINESS**, n. keenness of appetite for food or drink; voracity; ardent and selfish desire. **GREED**, n. *grēd*, greediness; avarice.—**SYN.** of 'greediness': eagerness; avidity; ravenousness; avarice.

GREEK, n. *grēk*: a native of Greece; the language; in *familiar language*, something unintelligible: **ADJ.** pertaining to Greece. **GREEK'LING**, n. a beginner in Greek. **GREEK CALENDs**, never; to defer a thing to the *Greek calends* is to defer it indefinitely or *sinē dīē*, as there were no calends in the Greek months.

GREEK CHURCH.

GREEK CHURCH, THE, or THE EASTERN CHURCH: in its widest sense, comprehends all those Christians following the Greek or Greco-Slavonic rite, who receive the first seven general councils, but reject the authority of the Roman pontiff, and the later councils of the Western Church. The G. C. calls itself 'the Holy Orthodox Catholic and Apostolic Church;' and it includes three distinct branches—the church within the Ottoman empire, subject directly to the patriarch of Constantinople; the church in the kingdom of Greece; and the Russo Greek Church in the dominions of the czar. The last must be alluded to in treating of its two sister-churches: for further details see **RUSSIAN CHURCH**. The proper history of the G. C. as a separate body dates from the commencement of the Greek schism, or rather from the commencement of the efforts on the part of the church of Constantinople to establish for itself a distinct jurisdiction and an independent headship in the eastern division of the empire. The ecclesiastical pre-eminence of Constantinople, followed on the political distinction to which it rose as the seat of the imperial residence, and the centre of the imperial government. Originally, Byzantium was but a simple episcopal see, subject to the metropolitan of Heraclea; but the rank of the see rose with the fortunes of the city; and before the close of the 4th c., a canon of the first council of Constantinople, 381, assures to it, on the ground that 'Constantinople is the new Rome,' the 'precedence of honor' next after the ancient Rome. This privilege, however, was purely honorary, and did not imply any pre-eminence of jurisdiction in the see of Constantinople, and there are many early instances in which questions arising within the district which afterward became the patriarchate of Constantinople, and even questions affecting the bishop himself, and even in his relations to the other patriarchs, were referred to the bishops of Rome. But the transition was not difficult, and was aided by the eminent qualities of some of the bishops, especially of St. John Chrysostom (see **CHRYSOSTOM, JOHN**); so that in the council of Chalcedon (451), a decree was passed, which confirmed the precedence already given, and not only assigned to Constantinople an extensive range of jurisdiction, but also grounded these ecclesiastical privileges in the case of the new as well as in that of the old Rome, on the political precedence to which both successively had risen. The Roman legates protested against this canon, and the claim led to a misunderstanding between the two churches, which was widened and confirmed by the doctrinal differences which prevailed on the Eutychian question, in which the patriarchs of Constantinople gave their support to the *Henoticon*, a heterodox or equivocal formula put forth by the Emperor Zeno, which was warmly resisted in the West. The pope, in consequence, 484, excommunicated the emperor, together with the patriarchs of Constantinople and Alexandria; and thus the East and West were, *de facto*, separated for nearly 40 years. The terms on which the excommunication was withdrawn by Pope Hormisdas, 519, involved a complete

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and explicit acknowledgment of the supremacy of the Roman pontiff; but the rivalry of Constantinople still subsisted. In the end of the 6th c., the Trullan Council (see **TRULLAN COUNCIL**) caused a renewal of the misunderstandings. Many circumstances combined to hasten a rupture: among these were, the claim to the title 'Ecumenical patriarch,' by the patriarch John the Faster, which claim was reprobated by Gregory the Great (see **GREGORY I.**); the contests about image-worship, in which the patriarchs in more than one instance took the part of the iconoclast emperors; the abandonment of the emperors of the defense of Italy against the Lombards; the gradual growth of an independent confederation of Italian states, and ultimately the foundation of a new empire of the West, the political antagonism of which with the eastern empire almost necessarily involved an antagonism of the churches themselves. Hence when, on occasion of his own personal contest with the see of Rome, the deposed patriarch Photius (862) (see **PHOTIUS**) identified his cause with that of the Eastern Church, he found a ready sympathy among his countrymen. The Latin doctrine of the twofold procession of the Holy Spirit, and the addition of 'Filioque' to the Latin creed, the Latin practice of clerical celibacy, and of denying to priests the power of administering confirmation, supplied the grounds of quarrel; and though the Photian schism fell with its author, and the communion of the churches was restored, their reconciliation was imperfect and far from cordial. The same causes of controversy, with others of a disciplinary nature, were renewed in the 11th c.; and in 1054, the pope Leo IX. issued a formal sentence of excommunication against the patriarch Michael Cerularius, which was solemnly published in Constantinople by the papal legates. Beyond the points of difference alleged by Photius, the most important of the new grounds of division was the use of unleavened bread by the Latins in the eucharist. Since that time, the separation has been perseveringly maintained. More than one attempt was made by the authorities on either side to restore the former relations of the two churches, but in vain. The old antipathies of East and West became more inveterate by the separation; and the occupation of Constantinople by the Latins, 1201, the outrages and atrocities by which it was disgraced, the establishment of the Latin kingdom at Constantinople, and the arbitrary tyranny by which it was maintained, widened still more the ancient estrangement. Nor was the breach healed by the re-establishment of the Greek empire, 1261. The Western emperors, from political motives, pressed on all sides by the fears of foreign invasion and the embarrassments of domestic discontent, proposed, as the price of the assistance of the West in their necessity, the restoration of the Eastern Church to the obedience of Rome. Michael Paleologus (q. v.), by his ambassadors, abjured the schism at the council of Lyons, 1274, and endeavored, by a synod held subsequently at Constantinople, to obtain a ratification of the union; but he failed to gain the assent of the body

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of bishops, and in the succeeding pontificate, the breach was even more seriously renewed, by two synods at Constantinople, 1283 and 85. The necessities of John Paleologus compelled him once again to resort to the same expedient; and the negotiations for union were on this occasion conducted with much more deliberation. Delegates of the G. C. with the patriarch of Constantinople at their head, attended at the great Western Council, 1437, of Ferrara (better known, from the place of its close, as that of Florence), and a protracted discussion took place, the chief points of which were the procession of the Holy Spirit from the Father and the Son, the addition of 'Filioque' to the creed, the nature of the purgation of souls after death, the use of unleavened bread in the eucharist, and the supremacy, by divine right, of the Roman pontiff. On all these points, the Greek delegates, with the exception of Mark, Bp. of Ephesus, subscribed the decree of the council; but this union was equally short-lived. On the return of the delegates to Constantinople, their proceedings were repudiated by the large body of the Greeks; and the downfall of the Greek empire and capture of Constantinople by the Turks, 1453. obliterated every trace of the attempted reconciliation. Since that time, some isolated bodies of Christians of the Greek rite have joined the Church of Rome (see end of this article); but every attempt at a general union on the part of the Roman pontiffs has proved a failure. It has been the same with the attempts which have been made by the Prot. communions to establish an understanding with the G. C. Very early after the Reformation, a letter was addressed by Melanchthon to the patriarch Joseph of Constantinople through a deacon, Demetrius Myseus, who visited Germany 1558. Another Lutheran embassy of a more formal character, headed by the well-known Tübingen divines Andreæ and Crusius, visited Constantinople during the patriarchate of Jeremias, 1576-81; but both missions were equally without result. In the following century, the celebrated Cyril Lucaris (see LUCARIS), who had been educated in the West, and had carried home with him a strong, though for a time carefully concealed bias towards Protestantism, opened the way for negotiations with the Calvinistic party. Soon after his elevation to the patriarchate, he issued a decidedly Calvinistical confession of faith, 1629. But far from carrying his fellow-churchmen with him in the movement, the innovations which he attempted not only led to his own deposition and disgrace, but called forth a doctrinal declaration, signed by the patriarchs of Constantinople, Alexandria, and Antioch, and many metropolitans and bishops, which, by the clearness and decision of its definitions, draws the line so markedly between the Greeks and reformers as to shut out all possibility of accommodation in matters of doctrine. This exposition was adopted by all the churches; and in a synod in Jerusalem, 1672, it was adopted as the creed of the G. C. This declaration, originally drawn up by Magilas, metropolitan of Kiew, was published, 1722, by order of Peter the Great, as an authorized formulary of the

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Russian Church, under the title of *The Russian Catechism*. With a few exceptions, specified below, it coincides with the formularies of the Rom. Cath. Church.

The G. C. comprised within its ancient limits, anterior to the Mohammedan conquest, Greece properly so called, the Peloponnesus, Eastern Illyricum, the Islands, and Asia Minor; also Syria and Palestine, Arabia, Egypt, and parts of Mesopotamia and Persia. But with the first triumph of the Koran, the church of Constantinople by degrees lost almost all her territory in Asia and Africa; and since the conquest of the Turks, it has sunk into the condition of a weak and oppressed dependant. By the separation of the Russian branch, partially in the 17th, finally in the beginning of the 18th c., and by the separation of the new kingdom of Greece, on occasion of the revolution, its importance has been further diminished. Each of three divisions into which it has separated possesses a distinct organization; but as the faith and practice of all are substantially identical, it is best to glance first at the doctrines of the G. C., especially in their relations to the Christian communions of the West, and to the controversies by which the East and West are separated.

In general, it may be inferred from the fact that the G. C. receives the first seven councils, that on all the controversies regarding the Trinity and Incarnation the Greeks are agreed with the Rom. Catholics, with the sole exception of the Roman dogma of the double procession of the Holy Spirit, in which they are at issue not only with Rom. Catholics, but probably with the great majority of Western Trinitarians: see FILIOQUE. While they reject the papal claim to supremacy and doctrinal authority, they agree with Rom. Catholics in accepting as the rule of faith not alone the Bible, including the Deuterocanonical books (see synod of Jerusalem in Harduin's *Coll. Concil.*, xi. col. 258), but also the traditions of the church, i.e., what are believed to be the unwritten revelations of our Lord and of the apostles, preserved by the testimony of the Fathers, among whom they regard with special veneration Basil, Gregory of Nazianzum, and Chrysostom. They admit the seven sacraments as received by the Rom. Church—viz., baptism, confirmation, eucharist, penance, extreme unction, holy orders, and matrimony; but in the rites used by them in the administration of these sacraments there are considerable discrepancies from the Latin rite. They administer baptism by a triple immersion; confirmation is administered in immediate connection with baptism, even in the case of infants, and it is administered by priests, and not, as among the Latins, by bishops exclusively. As to the eucharist, the Greeks admit the real presence of Christ, the transubstantiation of the elements, the propitiatory sacrifice, and (though this has been denied by some Prot. writers) the adoration of the host (see Renaudot, *Liturg. Collectio*, i. pp. 22 23). But they differ from Rom. Catholics in the use of leavened bread, in administering the communion in both kinds, and administering it in this form even to children. In the sacrament of pen-

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ance, they recognize, like the Roman Church, auricular confession, priestly absolution, and penitential works; and though they differ from the Latins as to the use of indulgences, they admit the principle on which their use is founded, and even their applicability to the dead. For the peculiarities of their use of extreme unction, see **EXTREME UNCTION**. In the sacrament of holy orders, they have many peculiar observances: see **ORDERS, HOLY**. The most striking point of difference regards clerical celibacy. The Greek Church recognizes the excellence of virginity, and the fitness of its observance by those engaged in the ministry, so far as to prohibit marriage altogether to bishops (who are always chosen, in consequence, from the monastic, and not from the secular clergy); to forbid priests or deacons to contract marriage after ordination; to forbid to all the clergy without exception, a second marriage, or marriage with a widow, and to require of married priests that they shall live separate from their wives during the time when they are actually engaged in church services. But they not only permit married candidates to be advanced to deaconship and priesthood, but even require, as a general rule, that they shall be actually married before they can be admitted to orders. While admitting marriage to be a sacrament, they hold it to be dissoluble in cases of adultery, and they regard fourth marriages as utterly unlawful. On the condition of souls after death, they do not admit with the Latin Church a purgatorial fire, but they admit the principle of the intermediate state of purgation, and of the practice of prayer for the dead. They admit also the intercession of saints, and the lawfulness of invoking them, especially the Holy Virgin Mary, and of honoring their shrines and relics. They do not permit the use of graven images, with the exception of that of the cross; but they freely permit and pray before pictures, which they hold in high honor, and on which they lavish most costly ornaments of gold, jewels, and other precious things. In their belief of the merits of good works, and especially of fasting, they go further than Rom. Catholics. Besides four yearly fasts—the 40 days of Lent, the season from Pentecost to the feast of Saints Peter and Paul, the 15 days before Assumption day, and the six weeks before Christmas—they observe Wednesdays and Fridays throughout the year as fasts. For their liturgy, see **LITURGY**; here it is enough to say that, in splendor of ceremonial, they are not inferior to the Westerns. Instrumental music, it is true, is forbidden in the churches, but singing is universally in use. In public prayer, the kneeling posture is used only at Pentecost; at ordinary times, they stand, facing toward the east. The use of the sign of the cross is habitual. The monastic institute has subsisted in the Greek Church from the earliest times, and numerous convents of both sexes are dispersed over the East, which follow almost exclusively the rule of St. Basil. The abbot is called Hegumenos, the abbess Hegumené; if several convents be subject to a single abbot, he is called **Archimandrite**. Both monks and nuns are bound by **vows**

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of celibacy. With both, the duty of manual labor is a leading observance; the nuns, like there western sisters, apply themselves to the care of the sick and to the education of girls and young women.

As regards the separate constitution of the three great sections of the Greek Church, the church in the Turkish empire has remained subject to the patriarch of Constantinople, who from the beginning received a continued but precarious protection from the sultan, and even held, as regarded his own flock, a civil pre-eminence, with the rank of a 'pasha of three tails.' But in return for this civil status, the Porte claimed the right of appointing and also of deposing the patriarch, a right habitually exercised as a matter of purchase and sale, and which led to the grossest simony, not only as to the patriarchate, but in the entire ecclesiastical system. Formerly, the metropolitan of Russia (afterward patriarch) was subject to the patriarch of Constantinople, as were also the bishops of the modern kingdom of Greece; but both churches are now independent of Constantinople. The patriarch of Constantinople, Jeremias II., 1589, consented to the creation of a separate but dependent patriarch; and this dependence continued until the time of Peter the Great, by whom the patriarchate was first suspended and afterward abolished, the Russian church being now governed by what is called the Holy Synod, an ecclesiastical commission appointed by the czar. The independence of the church of the kingdom of Greece dates from the revolution. The 'organic law of Epidaurus,' of 1822, Jan., proclaimed the Oriental Orthodox Church as the church of the state, and soon afterward measures were taken to organize this church in the new kingdom. For a time, the patriarch of Constantinople hoped to preserve his ancient authority; but the president of the new state, Capo d'Istrias, firmly resisted, and, after many preliminaries, the new church was formally organized by a decree of 1833, July 15 (27), on a plan in great part borrowed from the constitution of the Russian Church, as settled by Peter the Great. The governing body in the church of the kingdom of Greece is, as in the Russian, the so-called 'Holy Synod,' which consists of five members, who are ordinarily archbishops or bishops, but may admit into their number also one or two priests or monks. This synod is the supreme ecclesiastical tribunal, and in name at least is independent in spirituals; but as its members are all named by the crown, and hold office but for a year, it is practically a state instrument; moreover, two officials of the crown have a right to assist, though without a vote, at all its deliberations. The synod elects bishops, but the crown has the right of confirming and granting investiture. To it also belongs the power of regulating the limits of dioceses, and all such general arrangements. The last remnant of subjection to Constantinople was removed by a formal recognition of independence 1868, and the bishops no longer seek consecration from the patriarch of that see. In 1869, a correspondence took place between the Abp. of Canterbury and the patriarch, with a view to the union of the

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Anglican and Eastern churches; it brought no result. In the same year the government of Russia abolished the hereditary character of the Russo-Greek priesthood. The Russo-Greek Church is believed to number about 55,000,000. The Church of Greece comprehends a district of about 880 sq. m., and numbers about 800,000 members.

THE UNITED GREEK CHURCH comprehends those Christians who, while they follow the Greek rite, observe the general discipline of the Greek Church, and make use of the Greek liturgy, are yet united with the Church of Rome, admitting the double procession of the Spirit and the supremacy of the Roman pontiff, and accepting all the doctrinal decisions subsequent to the Greek schism which have force as articles of faith in the Roman Church. The United Greeks are found chiefly in s. Italy, in the Austrian dominion, in Poland, and in the Russian empire. In Italy, they are computed at 80,000; in Austria, at about 4,000,000; and in Poland, about 250,000. In Russia, it is difficult to ascertain their number. It has fallen off considerably in late years. In Austria, they are divided into Romanians and Ruthenians—the former being settled in Wallachia, Transylvania, and Eastern Hungary; the latter, in Little Russia, Galicia, and n.e. Hungary. The union of the Greek Christians of Wallachia and Transylvania dates from the end of the 12th c.; and though the Reformation made some progress among them, they still for the most part remain true to the union. The union of the Galician Greeks or Ruthenians is of much later date, about the close of the 17th c.: see RUSSNIACS: RUTHENIANS. The usage of the United Greek Church as to the law of celibacy is, with the consent of the Roman pontiffs, the same as among the other Greeks. They are permitted also to administer the communion under both kinds.

GREEK-FIRE: composition supposed to have been of nitre, sulphur, and naphtha as a principal ingredient, with which the Greeks of the Byzantine empire were wont to defend themselves against their Saracen adversaries. The accounts of its effects are so mingled with obvious fable, that it is difficult to arrive at any just conclusion as to its power; but the mixture appears to have been highly inflammable, and to have been capable of burning under water. It was projected either on blazing tow, tied to arrows: or through a tube, the precursor of cannon. Wherever the combustible fell, it made great havoc, from the inextinguishable nature of the fire. The invention of this material has usually been ascribed to Callinicus of Heliopolis, A.D. 668; but there seems reason to believe that it was imported from India. At Constantinople, the process of making Greek fire was kept a profound secret for several centuries. The knowledge, however, of its composition gradually spread; and at the time of the discovery of gunpowder G. F. formed a recognized defensive element in most wars from w. Europe to Asia Minor. Subsisting for some time concurrently with gunpowder, it gradually died out before the advance of that still more effective competitor, till now little vestige remains of G. F. beyond a Nor-

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man corruption of its name in our firework 'cracker,' which derived from 'Creyke' of the middle ages, is but a corruption of 'Grecque': see FIREARMS.

GREEK MUSIC, ANCIENT: subject of inquiry and discussion among the learned for hundreds of years. With the restoration of the arts and sciences at the end of the middle ages, the veneration for all that belonged to the Grecian people was carried to an extent that implied the indebtedness of the moderns to them for almost everything. Fortunately, various dissertations and fragments on music by old writers are extant, which, though not unfolding anything like a complete and satisfactory view of ancient Greek music, yet suffice to show that in ancient Greece the art of music was very imperfect; and that, in its elements and groundwork, it was entirely a slave to poetry, and could have been little else than a kind of intoned declamation. We find in old writers praise of the magic influence of music; but we must not forget that they used the word music in a collective sense for the gift of the muses generally; and when they spoke of the elevating and moral effects of music, it is to be understood that they meant a general harmonious cultivation of the arts and sciences. The system of music known to the ancient Greeks, and as practiced in their temples and theatres, differed essentially from our modern music, as their scale, or succession of sounds, was not based on the octave and its repetition, but on a fourth and its repetition. Their scale consisted of five tetrachords, each containing four consecutive sounds; the last sound of one tetrachord being always the first of the next; while two of their tetrachords had more than one sound in common. In modern music, the ancient Greek scale would be as follows: B, C, D, E; E, F, G, A; A, B \flat , C, D, etc. This they called the diatonic genus. They had also their chromatic genus, thus B, C, D \sharp , E; E, F, G \sharp , A, etc.; and their enharmonic genus, the tetrachords of which consisted of two quarter-tones (which cannot be expressed in modern music) and a major third. It is beyond a doubt that the ancient Greeks neither possessed a system of notation by which their music, such as it was, might have been preserved, nor had they any idea of harmony in the modern sense of the word. Many believe it impossible that a people who have left us specimens of their poetry and sculpture, which, after 2,000 years, are still admired as master-works, could have been content with such an imperfect and clumsy system of music. Had it been otherwise, it is scarcely possible to imagine that the knowledge of it would not have been handed down to us. An ode by Pindar, and a hymn or two set in modern notation from an old Greek ms., is all that we can claim to possess of ancient Greek music, and even those are said by many to be spurious.

GREEK PHILOSOPHY. see PHILOSOPHY.

GREEK RELIGION.

GREEK RELIGION, ANCIENT: most poetical and most humane of polytheisms, presenting itself in historical times as a plastic worship of nature, with its visible objects and its invisible powers; of abstract notions, sensations, propensities, and actions; of tutelary Numina, household or family gods; and of exalted men or heroes. Composed of such widely discordant elements, this good Hellenic Pantheon offers yet a unity so harmonious and consistent in its minutest parts that its origin is even more difficult to trace than that of the people itself, which, from a conglomeration of heterogeneous races and tribes, was fused in an incredibly short space of time into one great group of equal propensities and of nearly equal gifts. This question of the origin of the Greek religion has indeed been a point at issue from the time of Herodotus to our own. While he, together with many others, pronounced it to be almost completely an importation from Egypt, a strong autochthonic school held it to be homesprung; and these two antagonistic views—the East and Hellas—have, in a more or less modified form, found their foremost representatives in modern days in Creuzer on the one side, and Otfried Müller on the other. The new and important science of Comparative Mythology, however, may be said to have set this point at rest; for it proves, almost to demonstration, that the fundamental ideas of the Greek religion are due to the regions n.w. of India, the cradle of the main Hellenic stock (see ARYAN RACE); while subsequent colonists introduced additional gods from Phœnicia, Egypt, and other parts of the East. All these, with the host of personified fancies and ideals begotten by the poets at home, were soon amalgamated into one great system. Yet those foreign elements, so far from detracting from the originality of the Greeks, show in a still stronger light what brilliancy of conception and power of imagination, what harmony and plasticity, had fallen to the share of the inhabitants of Hellas—a land which in itself, by the immense variety of glorious scenery of sea and sky, wood and mountain, river and bay, rock and island, contributed not a little to quicken that immortal youthfulness by which they were so aptly and strikingly called throughout the East the people of Yavan (Skr. *Yuvan* = *Juvenis* = *Young*). The gods, from the moment they touched these shores, from dead symbols became living realities, with all the qualities and sensations, aims and actions, of a living individuality, and that individuality the highest among earthly things—man. Anthropomorphism, indeed, is the chief characteristic of Greek religion. The brute creation—which to the East was something to be exalted, and to be adopted as the type of divinity—furnished the Greeks only with a few attributes for their humanly shaped gods. But man, the ideal of creation, was deficient in one thing, the duration of his life was limited; and in this the gods differed from him—they were immortal. In all other respects they were like himself—they loved and hated, they ‘transgressed’ and suffered. No ideal moral code existed with the Greeks; consequently, their gods, when they could not attain the objects of their many and

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strong desires in a straightforward manner, had unscrupulous recourse to stratagem and cunning, and, through their questionable practices, not unfrequently brought themselves into very undignified positions. Yet the influence of such unworthy conceptions of the gods was not so immediately fatal, in a moral sense, to the believer as at first it would seem; for man's conscience still cast some dim light on character and duty, and did not fully accept the Greek deities as patterns for humanity; they were, through their mighty origin, their almost unbounded powers, and their immortality, exempt from the ordinary laws which must rule the dealings in the commonwealth of low, weak, dying humanity. They were a kind of exalted aristocracy, who could not be judged by a human standard, much less be imitated by human beings; and, after all, even they had to submit to a supreme fate (*Moirā*), which found out their guilt, and punished it. The mortal, however, was subject to them individually; and it was his special province to fulfil the duties of piety and modesty toward them, of righteousness and justice toward his equals. On this condition alone, the undisturbed enjoyment of life, with all its most glorious gifts, was his. Retribution for evil doings followed, with rare exceptions, speedily and irrevocably. There was a hereafter, but it was a shadowy thing, without life and blood, a miserable nether world of cheerless twilight. Only for very extraordinary crimes was there something like a real, fearful, and everlasting punishment in store in the Hades, or the still more terrible Tartarus; while, on the other hand, only the most exalted heroes are, after their death, endowed with a new body and enjoy the pleasures of Elysium. But these are very exceptional cases: 'When a man is dead,' says the shade of Anticlea, 'the flesh and the bones are left to be consumed by the flames, but the soul passes away like a dream.'

In the Greek theology may be traced a historical development from the days when the early Pelasgians invoked, like their Persian and German kinsmen, the highest god without image or temple, and the minor deities as the 'Great Ones,' the 'Unknown Ones,' the 'Merciful Ones,' without distinct name and shape—to the time when every sound and every sight, every thought and every deed, had a significance as being caused and inspired by a god; when the prodigious number of clearly defined, and individually and most sumptuously worshipped gods formed a mighty impulse to the development of the arts: and from that period down to the days when the poets put prophecies of the speedy death of the gods into the mouths of their heroes; when philosophers, openly declared 'these things to be fancies and dreams,' and religious persecutions hastened the downfall of a creed which had become adulterated by foreign elements no longer to be amalgamated—until Christianity came forth, and not only deposed the gods of Greece, but sent them, branded with the names of 'evil powers,' or 'demons,' in the sense of eastern 'Satans,' to perdition. Around the Greek polytheism gathered innumerable myths and legends, traditional or invented in historical times by poets and phi-

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Philosophers: these with the main system itself, and with its developed philosophy, had immense influence on other religions, the Christian among them. We trace here only the outward forms of the religious worship of the Greeks, in the so-called classical period: For some account of the principal deities, see their special titles.

Without entering into the principal division of the gods into heavenly, terrestrial, and maritime, we note the supreme council of the twelve national gods, who, with a vast male and female retinue, dwelt on the heights of Mount Olympus, around its highest peak. This peak reaching into the sky (Ouranos), was inhabited by Zeus (or Jupiter) son of Chronos—Zeus the highest, mightiest, and wisest being, king and father of gods and men: who watches over all human doings, principally over hospitality and the sacredness of oaths. Second in power is his brother Poseidon (or Neptune) shaker of the earth, ruler of the sea and all the waters of the earth. Next stands Apollo, son of Zeus and Selo (darkness); he (as Phoibos) is the sun, and darts his rays or arrows as god of the chase, as god of destruction, as well as of beneficence. But he is not god only of the physical, but also of the mental light; hence to him belongs the insight into future events. He is the god of oracles, but, as such, equivocal (*loxias*); further, god of poetical inspiration, song, and music—leader of the muses. He is one of the few sublime figures among the gods. In his love and in his hatred, he is always enshrouded in a sacred dignity, of which even the most ribald fiction stood in awe. The god of the terrestrial fire, which in his person had been thrown from heaven to earth, is Hephæstus (or Vulcan). His workshops are volcanoes, where metals are forged and wrought by him into artful forms; and as volcanic soil best matures wine, to him was assigned the office of cupbearer of the gods. Ares (or Mars) presides over war. Battles, slaughter, rapine, and the doom of cities are his delight. Hermes (or Mercury)—originally, perhaps, the symbol of animal generation—appears as patron of the herds. He is the guardian of the roads and the messenger of the gods; he is, moreover, the inventor of the lyre and gymnastics. He is the presiding genius of commerce, and, as such, a knave, even a thief. With Zeus is coupled Hera (or Juno), his sister and wife—beautiful, majestic, but exacting and quarrelsome. The foremost daughter of Zeus, and who sprang from his head in full armor, is Athens (or Minerva) who stands in a twofold relation to the light, physical as well as mental—whence she becomes the goddess of understanding and wisdom—and to the water (*Tritogeneia*); hence also her rivalry with Poseidon. The two elements, the warm and the moist, giving rise to the fertility of the earth, she is the goddess of the grain and of the crops; she is likewise goddess of war, and presides over female handiwork. Artemis (or Diana) twin-sister of Apollo, shares with him the chase and the light: her attributes are a torch and the moon. The Phœnician goddess Astarte had risen from the foamy waves on the Greek shores as Aphro-

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dite (or Venus), the Greek goddess of beauty, of love, of voluptuousness. Her counterpart was the chaste maiden-goddess Hestia, in whom was personified the hearth as the centre of the house and family. From the perpetual fire on her altar, the colonists took the flame which was to accompany them to their new settlements. The list of the Olympians closes with Demeter or Gaia, goddess of agriculture, consequently, of settled institutions and laws.

An indefinite number of other gods followed, some of them little inferior in power and dignity to the twelve, and who sometimes, like Dionysus, the god of goat-herds and wine-growers, and others, acted as the special deities of certain classes. Of such were Hades, Helios, Hecate, Leto, Dione, Persephone, Themis, Eos; the Charites, the Muses, the Moeræ, Proteus, the Nymphs, and other *daimons*—partly primeval local deities, partly deified powers of nature; river, mountain, and forest gods; or personified abstract notions—such as Tyche, Psyche, Hebe, Thanatos, Phobos, Hypnos, Kratos, Bia, and the like conscious or unconscious allegories. Besides these, there is a mob of deities, or rather monsters, begotten by gods—the Harpies, the Gorgons, Pegasus, Chimæra, Cerberus, Scylla and Charybdis, the Centaurs, the Sphinx, etc.

A palpable link between gods and men is found in the heroes or demigods—i.e., men deified after death—a race sprung from the embraces of gods and the beautiful daughters of man. They became either, like Heracles (or Hercules) (the Phœnician Melkarth), founders of races, who were thus considered the sons of gods, or patrons of special trades and professions, like Dædalus, the *heros* of artificers and others. The absence of that dark and terrible, essentially Eastern, notion of an evil principle, co-existent with the good, between which two rival powers the world is divided; the undaunted geniality of the Greek nature; the tendency toward humanizing the whole universe and its gods, who, again, had not disdained to ally themselves with mankind; and above all, the emancipation from an all-ruling hierarchy such as swayed the East, made the Greek religion dogmatically, as well as practically, more bright and festive than the Eastern systems, as well as the most tolerant of ancient creeds. It was a Sadducean system, utterly unspiritual—an artistic, decorated, transfigured worldliness: the gods indeed were not heavenly beings; they were practically 'earthly'—of the earth and air and sea. The outward as well as the inward worship of the gods was with the Greek purely a personal affair. No mediator stood between the individual and the deity; every freeborn man, woman, and child had the undisputed right to pray and to sacrifice when and where he pleased. The only office of the priests consisted in the care of certain sacred property, in providing for the service of the temple, in the performance of certain traditional rites, the recitation of certain ancient formulas handed down in the priestly families, and the expounding of the will of the gods expressed by oracles. The Sacrifices (q.v.), which in earlier days had consisted in the votive of-

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fering of a lock, a garland, a tablet, or such simple fruits as were yielded by the soil, gradually, as hills and groves no longer sufficed, and temples, stately and sumptuous, adorned with gorgeous statues, had been erected, grew into splendid feasts, of which the gods were invited to partake, together with those who sacrificed. For the periodical festivals in honor of special deities, the games and sports, the scenic representations and musical contests connected with them, and of their peculiar influence in raising the literature, arts, and philosophy of the Greeks above that of all mankind, see FESTIVALS: DIONYSIA: PANATHENEIA: THESMOPHORIA: ELEUSINIAN MYSTERIES, under ELEUSINIAN (where also the subject of the Mysteries is touched upon): OLYMPIAN GAMES: PYTHIAN GAMES: NE-MEAN GAMES: ISTHMUS.

One of the most characteristic provinces of the Greek cult was that belonging to the mantics or diviners. The Greek, looking upon the gods as his omnipresent friends, who were able and might be willing to caution him against threatening dangers—or, in other words, convinced by his own strong sympathy with nature, that a derangement of his own affairs, however unknown to himself, must produce a corresponding derangement in nature—could not but give some credence to the foreboding significance of natural or ‘supernatural’ prodigies or signs. The ether or space between heaven and earth, would be the principal scene of these revelations; the storms that swept through it, the thunder that rolled around it, and the birds that floated in the blue abyss, were all so many divine omens. No less would the gods speak in the offerings immediately addressed to them—in the innermost entrails of the sacrificial animal—in the flame that rose from their altar—in dreams of the night, and strange sounds and portents by day: thus if in the midst of the assembled people, an ominous animal appeared, they speedily dispersed. Yet the free and clear Greek mind could hardly sink into grovelling imbecility, as was the case in relation to augury with the Etruscans (q.v.); and Homer—though to the astonishment of Xenophon—puts into the mouth of Hector the momentous words: ‘One omen only is significant—to fight for one’s country!’

The growth of culture did indeed early free the Greeks from the vague awe of everyday phenomena, and the science of manticism fell accordingly into the hands of the lowest jugglers and soothsayers, believed in only by the herd. But in the same degree, there rose into importance another and exalted kind of prophecy—the Oracles (q.v.). In this, the god Jupiter—afterward principally Apollo, his son, partaker in his counsels—spoke himself: first, in the rustling of leaves, in the clangor of brass basins, later, in distinct human words. He chose the weakest vessels—women, girls, to whom the divine gift was a burden and a pain. The Sibyl herself does not understand what the god says through her mouth; she is unconscious—in a state of somnambulism—of mania. But here the priests step in; they act as interpreters, as prophets, as *Evangelides* (the

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progeny of some *Evangelos*), 'bringers of good tidings.' Their influence, socially and politically, increased with that of the oracles themselves, especially when these latter, by degrees, from being casual and unforeseen, became frequent and regular. The richest gifts poured in from all parts, as it grew matter of piety to have recourse to them as means of grace. They thus rose into an institution, the importance of which, principally for the unity and consequent rise of Greece as a political power, is not easily overrated. Besides the oldest oracle—that of Jupiter and Dodona—there were 260 counted throughout Greece; among them those of Didyma, Delos, Abæ, Klaros, Larissa, Tegyra, of Trophonius—in a subterranean cavern—and of Amphiaraus, near Oropus, in Attica, where the answers were revealed in dreams. But by far the most famous, and of highest import for the whole nation as such, was that of Delphi (q.v.), where the Amphictyonic council was held; where everything connected with the public worship throughout the country was settled; where the calendar itself was regulated; where, in fact, for a very long time was the real central power of Greece.—The voice of the oracle ceased under Julian the Apostate.

GREELEY, *grē'lē*: city, cap. of Weld co., Colo.; on Caché la Poudre river; midway between Denver and Cheyenne; 20 m. from the Rocky Mountains. It is in a beautiful valley, rich in coal, building stone, and timber; prohibits the sale or giving away of liquor; with 50,000 acres of farming land is inclosed by a single fence 45 m. long; is irrigated by an artificial canal 36 m. long; and contains 5 churches, a \$20,000 school building, numerous graded and primary schools, several mills and tanneries, 1 national bank (cap. \$100,000), 2 private banks, and 2 weekly newspapers. G. was founded 1870. Pop. (1880) 1,297; (1900) 3,023.

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GREELEY, grē'lē, HORACE, LL.D.: 1811, Feb. 3—1872, Nov. 29; b. Amherst, N. H.: journalist. He was of Scotch-Irish ancestry, precocious and feeble as a child, fond of books, and bred to farm life. After several attempts he succeeded in entering apprenticeship to the printer's trade in the office of the *Northern Spectator*, E. Poultney, Vt., 1826. He soon became a skilled type-setter, and was beginning to attract attention as a contributor of political, economic, and agricultural articles to the paper when it was suspended 1830. Released from his apprenticeship, he spent over a year tramping through the country, and working in printing offices wherever he could find opportunity, and arrived in New York in about the same plight as that in which Franklin reached Philadelphia, 1831, Aug. 17. He worked as journeyman printer in various offices till 1833, Jan. 1, when, in conjunction with Francis Story he started the first daily penny paper ever printed, the *Morning Post*. The paper was suspended in less than a month, but the job-office was kept running till the death of Mr. Story in July following. In 1834, Mar., G. formed a partnership with Jonas Winchester, and started the *New Yorker*, a weekly paper devoted to literature, politics, and news. This paper gained rapidly in circulation and lost steadily in capital, and G. was obliged to engage also in other work. He wrote editorials for the *Daily Whig*, and while continuing his *New Yorker*, was selected by William H. Seward and Thurlow Weed to conduct the *Jeffersonian*, a weekly whig campaign paper 1838. The *Jeffersonian* was published one year, and in 1840, May, G. started a new campaign paper, the *Log Cabin*, in the interest of the presidential candidacy of Gen. William Henry Harrison. This attained remarkable circulation, was published simultaneously in New York and Albany, and brought its editor into national prominence. His judgment and influence were sought on the stump and in the council, and he was especially fortunate in being able to adjust numerous political differences among the whig leaders. At the close of the campaign he merged the *New Yorker* and the *Log Cabin* into a new venture, and 1841, Apr. 10, brought out the first issue of the *Tribune*, with which he remained connected till death. Though active and influential in political councils and on the stump and lecture platform, G. did not become a political office holder till 1848, when he was elected a member of congress to fill a vacancy, and served three months. While in congress he made a sturdy fight against the abuses of the mileage system, and created wide-spread hostility by publishing in the *Tribune* a list of the mileage accounts of members of congress with free comments. He also introduced the first bill to give homesteads, free, to actual settlers on the public lands. The year of his election to congress he vehemently opposed the Mexican war, declaring its simple purpose to be the addition of more slave territory to the general domain; and his early anti-slavery convictions were intensified from this time forward. In 1851 he made his first trip to Europe, and was appointed a juror of the World's Fair in London. He also testified before a parliamentary

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committee on newspaper taxes. After his return to New York he gave his sympathies and influence to the free-soil movement, and though opposing the whig platform supported Gen. Scott, the whig candidate for pres. 1852. In 1854 he announced 'the dissolution of the political firm of Seward, Weed, and Greeley, by the withdrawal of the junior partner,' and in the following year made a second trip to Europe to attend the French exhibition. In 1856 he gave a vigorous support to the presidential candidacy of John C. Fremont, was indicted in Va. for circulating the *Tribune*, there declared an incendiary document, and was personally assaulted in Washington. With pen and voice he labored indefatigably and successfully to secure the admission into the Union of Kan. as a free state, and his name was bitterly denounced through the South. In 1859 he made a trip across the plains to California and was enthusiastically received in San Francisco and Sacramento. The approach of the civil war brought him great mental distress. He labored with all his vigor to prevent a resort to arms, but when the crisis seemed inevitable he stood up in the national republican convention at Chicago (1860, May) and demanded a thorough and unflinching prosecution of war measures. After the attack on Fort Sumter he raised the cry 'On to Richmond,' and to the close of the war supported the govt.—sometimes, however, sharply censuring its delay—in its attempts to crush rebellion, encouraged volunteering, sustained the drafts, and pleaded powerfully for the legal removal of what he deemed the cause of the war—slavery. In 1864, with the sanction of Pres. Lincoln, he made an unsuccessful attempt to negotiate a termination of hostilities, was a presidential elector for the state of N. Y., and a delegate to the Loyalist Convention at Philadelphia. After the final surrender (1865) G. became as earnest in advocating pacific measures, impartial suffrage, and universal amnesty, as he had been in demanding a vigorous prosecution of the war. He opposed the action of the federal govt. in holding Jefferson Davis a prisoner without trial, and oblivious to all personal and pecuniary consequences, went to Richmond and in open court signed the bail-bond of the ex-Confederate president. In 1867 he was a member of the N. Y. convention for revising the state constitution; 1868 supported the presidential candidacy of Gen. Grant, though dissatisfied with the party's choice of a candidate; 1869 was defeated as candidate for state comptroller; 1870 was defeated for congress though he polled an unusually large vote; and 1871 made a trip through Tex. to study the effects of the govt. reconstruction measures. During the latter year a number of the most eminent republicans in and out of congress, dissatisfied with various features of Pres. Grant's administration, united in forming the 'liberal republican' party. The first convention was held in Cincinnati 1872, May 1, to nominate a candidate for pres. against Pres. Grant. On the 6th ballot G. received 482 votes and Charles Francis Adams 187, G. was declared the choice of the convention for candidate for pres., and Gov. B. Gratz Brown for vice-pres. In July following, the na-

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tional democratic convention also nominated G. for the presidency. Pres. Grant was renominated by the national republican convention. The elections resulted in a popular vote of 2,834,079 for G. and 3,597,070 for Pres. Grant, who also had 286 electoral votes. The canvass was one of the most remarkable on record, and the work in it of G. was simply marvellous. The loss of his wife during the canvass and the excessive toil and intense excitement to which he had been subjected, brought on inflammation of the brain, from which he died 3 weeks after the election. His funeral was the occasion of an imposing demonstration in New York, in which the pres., vice-pres., and chief justice of the United States participated.—G. interested himself in various plans and theories for the reform of society. In all that he undertook he was indefatigable, independent, and courageous. His tastes were not scholarly; but he was master of an almost perfect style for political disputation, simple and clear, vigorous and keen. He was for many years an active member of the American Institute and the Farmers' Club. He was author of *Hints Toward Reforms* (New York 1850); *Glances at Europe* (1851); *History of the Struggle for Slavery Extension* (1856); *Overland Journey to San Francisco* (1860); *The American Conflict*, 2 vols. (1864, 66); *Recollections of a Busy Life* (1869); *Essays on Political Economy* (1870); and *What I Know of Farming* (1871).

GREELY, grē'li, ADOLPHUS WASHINGTON: b. Newburyport, Mass., 1844, Mar. 27. He graduated at the Brown High School 1860, enlisted in the 19th Mass. inf. 1861, was appointed 2d lieut. 81st U. S. col'd inf. 1863, Mar. 18, promoted 1st lieut. 1864, Apr. 26, brevetted maj. of vols. for services during the war 1865, Mar. 13, appointed 2d lieut. 36th U. S. inf. 1867, Mar. 7, assigned to 5th U. S. cav. 1867, July 14, and promoted 1st lieut. 1873, May 27. From the close of the civil war till 1881 he was on detail duty in the U. S. Signal Service. In that year he was appointed commandant of the govt. expedition to the arctic regions to establish circumpolar stations for scientific purposes. He reached Discovery Harbor 1881, Aug. 12, and was rescued with 5 men out of his force of 24—all at the point of starvation—by the third relief expedition sent after him at Cape Sabine, 1884, June 22, the remainder of his party having perished. He was promoted capt. 1886, and appointed chief signal officer with the rank of brig. gen. 1887. During the Spanish war, 1898, he so ably managed the signal corps that President McKinley was apprised of events in Cuba within a few minutes of their occurrence.

GREEN, a. grēn [Icel. *græ*, to grow; *grann*, green: Dut. *groeyen*, to grow; *groen*, green]: of the color of plants or herbage; verdant; flourishing; fresh; not dry; half-raw; unripe; inexperienced: N. a color (see GREEN COLORS): a small grassy plain. GREENS, n. plu. grēnz, certain fresh vegetables dressed for food (see below). GREEN'ISH, a. somewhat green. GREEN'LY, ad. -li. GREEN'NESS, n. quality of being green; unripeness; freshness; vigor; inexperience. GREEN-BONE, two kinds of British fish, as the

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garfish or sea-needle, so called from the color of their bones when dressed. GREEN-CROP, a crop, such as grasses, turnips, etc., used chiefly as fodder for cattle. GREEN-EARTH, an earthy variety of chlorite, occurring in various shades of green; often found filling the cavities of amygdaloid, or incrusting agates in that rock, sometimes also massive or disseminated, chiefly in trap rocks: it consists principally of silica, alumina, and protoxide of iron, the silica constituting about one-half. It is used as a pigment by painters in water-colors, who know it by the name of *Mountain Green*. In N. J., green earth is used as a manure, and is said to be very beneficial. GREEN-EYED, having eyes that see through a false medium as if colored with green; jealous. GREEN-MANTLED, covered with verdure. GREEN-GOOSE, a young goose, so named from the color of its hairy covering; more likely a mere corruption of *grain-goose*, that is, a young bird fattened on grain, etc., for the table. GREEN-GROCER, one who deals in vegetables and fruit. GREEN-HAND, one raw and inexperienced. GREENHORN, n. an ox with his horns first beginning to appear; a raw youth easily imposed upon; one unacquainted with the world. GREENROOM, n. in a *theatre*, the actors' retiring room, perhaps originally so named from its rustic character or prevailing embellishments. GREEN-SICKNESS, a disease in which the person affected has a sickly paleness, with a green tinge of the complexion, chiefly confined to unmarried females; chlorosis. GREEN-SWARD, n. turf on which grass grows. GREEN WOOD, unseasoned wood; a wood or forest when the leaves are out: ADJ. pertaining to. GREEN TEA, a name of several commercial varieties of tea. GREEN TURTLE, the species of turtle imported as a luxury for making turtle soup. SCHEELE'S GREEN, a pigment of a vivid light-green color, consisting of arsenite of copper.

GREEN, ANNA KATHARINE: see ROHLFS, ANNA KATHARINE.

GREEN, grĕn, ASHBEL, 'D.D., LL.D.; 1762, July 6—1848, May 19; b. Hanover, N. J.: Presb. clergyman. He served in the revolutionary army 1778-82, graduated at the College of New Jersey 1784, was tutor there one year, chosen prof. of mathematics and natural philosophy there 1785, licensed to preach 1786, and installed pastor of the Second Presb. Church, Philadelphia, 1787, with which he remained till 1812. In 1792 he was elected chaplain of congress, and 1812 pres. of the Princeton Theological Seminary (Presb.), and held the latter office 10 years. He was a staunch 'Old School' Presb., had great weight of character, and was a forcible preacher. He edited the *Christian Advocate* 1822-34; published *Discourse delivered in the College of New Jersey, with a History of the College* (1822); *Presbyterian Missions, Sermons on the Assembly's Catechism, Sermons from 1790 to 1836, Reports and Addresses from 1793 to 1836*, and an edition of Dr. Witherspoon's works. He received the degree LL.D. from the Univ. of N. C. 1812.

GREEN, BARTHOLOMEW: 1666, Oct. 12—1732, Dec. 28; b. Cambridge, Mass.: printer. He learned the printer's

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trade with his father, succeeded to his business, removed his press to Boston, and brought out the first number of the *Boston News Letter* 1704, Apr. 24, which he edited and published till his death. He was govt. printer 40 years, and for 15 years his newspaper was the only journal regularly issued in the American colonies.

GREEN, HORACE, M.D., LL.D.: 1802, Dec. 24—1866, Nov. 29; b. Chittenden, Vt. He graduated from Middlebury College 1824, practiced medicine at Rutland several years, after which he made a special study in European hospitals of diseases of the throat. He became prof. in the medical college at Castleton, Vt., removed to New York 1850, again went abroad for study 1851, and was afterward a prof. in the New York Medical College, and one of the editors of the *American Medical Monthly*. On account of the failure of his health, he gave up practice, and went to Cuba 1860. He published several medical works.

GREEN, JACOB: 1722, June 22—1796, May 24; b. Malden, Mass. He worked at a trade to pay his way through college, graduated from Harvard 1744, became pastor of a Presb. church in Morristown, N. J.; also practiced medicine. He was chosen pres. of the College of New Jersey, was delegate to the N. J. provincial congress 1775, and was chairman of the committee by which the state constitution was drafted. He wrote largely on finance, and published two vols. of *Sermons*. His *Autobiography* appeared in the *Christian Advocate*. He died in New Jersey.

GREEN, JOHN RICHARD, LL.D.: 1837—1883, Mar. 9; b. Oxford, England: historian. He received his early education at Magdalen College School, studied with private tutors 3 years, obtained a scholarship at Jesus College, Oxford 1855, took his degree 1860, received holy orders and was vicar of St. Stephen's Church, Stepney, till 1869, when he resigned and was appointed by the Abp. of Canterbury librarian at Lambeth Palace. While an undergraduate he became an enthusiastic student of history, and while holding his vicarage he divided his time between parochial duties and historical study in the British Museum. After his appointment to the Lambeth library he set himself to work as a historian, and 1875 produced his first great work, *A Short History of the English People*, which had immediate and abundant success. Without allowing himself rest he began elaborating the work, and 1877-80 brought it out in 4 vols. under the title *A History of the English People*. He afterward edited a series of *Historical Primers*, published *The Making of England* (1882), and nearly completed *The Conquest of England*, which his widow finished and issued. His health was feeble from a child, and he died while seeking recuperation at Mentone, France.

GREEN, JOSEPH F.: naval officer: b. Me., 1811, Nov. 24. He became midshipman 1827, served in the Mexican war, and in the civil war was connected with the s. Atlantic blockading squadron. By various promotions he reached the rank of rear-adm. 1870. He retired 1872.

GREEN—GREENAWAY.

GREEN, SAMUEL: 1615–1702, Jan. 1; b. England. He came to New England in early life, settled in Cambridge, and was one of the first men to engage in printing in the colonies. The legislature gave him 300 acres of land. Among his publications were the *Cambridge Platform* (1649), the *New Testament* (1661), *Eliot's Indian Bible* (1663).

GREEN, SAMUEL ABBOTT, M.D.: born Groton, Mass., 1830, Mar. 16. He graduated from Harvard College 1851, studied medicine, made a long visit to Europe, and then commenced practice in Boston. He was a prominent surgeon throughout the civil war, and received the brevet of lieut.col. of vols. He was a trustee of the Boston public library 1868–78, city physician 1871–80, and mayor of the city 1882. He has written largely on historical and scientific topics.

GREEN, SETH: 1817, Mar. 19—1888, Aug. 20; b. Rochester, N. Y.: pisciculturist. He engaged in the fishing business, carefully observed the habits of fish, experimented in artificial hatching, and 1864 began the propagation of fish for profit. He made valuable inventions for hatching spawn, was successful in hybridizing various varieties, was for several years supt. of the N. Y. Fisheries Commission, and from 1870 till his death had charge of the state hatchery at Caledonia. He published *Trout Culture* (1870), and *Fish Hatching and Fish Catching* (1879).

GREEN, WILLIAM HENRY, D.D., LL.D. Presb. clergyman; b. Groveville, N. J., 1825, Jan. 27. He graduated at Lafayette College 1840, studied in the Princeton Theol. Seminary, became tutor there 1846, was ordained to the ministry 1848, and installed pastor of the Second Presb. Church Philadelphia, 1849. In 1851 he was chosen prof. of Hebrew and Old Test. literature in Princeton Theol. Seminary, and held the office till death. He was a profound scholar in his department, and was chairman of the Old Test. company of the American Bible revision committee. He declined the presidency of the College of New Jersey 1868. He was author of a *Hebrew Grammar*, *Hebrew Chrestomathy*, *The Pentateuch Vindicated from the Aspersions of Colenso*, and *The Argument of the Book of Job Unfolded*. He died, 1900, Feb. 10.

GREENAWAY, grēn'a-wā, KATE: water-color artist; b. London, England, about 1850. She was the daughter of a wood-engraver, received her first instructions in drawing from him, and afterwards studied in London and S. Kensington. She exhibited first in the Dudley Gallery 1872–3, and then began making designs for juvenile books and of juvenile subjects. Her draperies of children so pleased the popular fancy that many were adopted in England and the United States as designs for children's costumes. She contributed to the *People's Magazine* of London; illustrated *Mildred's Mistake* and *Topo* (1876–7); and published *Kate Greenaway's Little Folks' Painting Book* and *Under the Win-*

GREENBACKS—GREEN BAY.

dow (1879); *Kate Greenaway's Birthday Book* (1880); *Mother Goose* and *A Day in a Child's Life* (1881); pictorial edition of *Little Ann* (1883), *Language of Flowers* (1885). D. 1901.

GREENBACKS: bank-notes issued by the U. S. govt. during the war of secession 1861-65; popularly thus named from the green color of many of them. The designation, which came to be loosely used for all U. S. bank-notes, is no longer in frequent use. During the war the immense expenditure of the government led to the issue of an unprecedented number of bank-notes, bonds, and currency papers of various kinds. At first, the manufacture of these notes taxed the resources of the government in a very embarrassing way; and there was ample reason to suspect that forged notes and bonds were abundantly in circulation; but, by degrees, a fine and large establishment was organized at Washington, under the immediate control of the sec. of the treasury. In this establishment, everything was conducted from first to last; rags, fibres, plates of steel, and colors were taken in, and finished notes were sent out. The precautions used were such as almost completely to baffle forgers; and the same system has been maintained, the bank-notes of the United States being manufactured by the government in the treasury dept. at Washington—the engraving of the steel dies, the printing, the making of the paper and the ink being all conducted under the same auspices. From the civil war onward, the currency of the United States consisted mainly neither of gold nor silver, but of the greenbacks, or inconvertible paper money, issued during the civil war, whose value fluctuated greatly. This paper was declared convertible into coin 1879, Jan. 1; and specie payments were then completely resumed. Since then, the paper money, formerly at very great discount, is on a complete par with gold. See **BANK—BANKING: CURRENCY: FINANCE: MONEY.**

GREEN BAY: part of Lake Michigan, separating Wisconsin from the upper peninsula of Mich.; extending from the n.w. part of the lake 140 m. s.w. into Wis., with average breadth 30 m., depth 500 ft., and surface elevation above sea-level 578 ft. Its name is derived from the beautiful green color of its waters.

GREEN BAY: city, cap. of Brown co., Wis.: on the Fox river, and the Chicago and Northwestern, Wisconsin Central and G. B. and Minnesota railroads; 100 m. n. of Milwaukee. It possesses a fine harbor and grand facilities for trade and navigation, and is at the terminus of the proposed navigable connection between the lakes and the Miss. river by the Fox and Wis. rivers. It is the seat of a Rom. Cath. bp., has 13 churches, a high school and 12 graded and primary schools, Rom. Cath. acad. and convent, co. court-house, 3 nat. banks (cap. \$350,000), and several daily and weekly newspapers. It is connected with Fort Howard on the opposite side of the river by a substantial bridge. The chief industries are the export of shingles, staves, headings, and hard woods, white and trout fisheries, grain and flour trade, iron-works, breweries, machine-

GREENBUSH—GREEN COLORS.

shops, and planing-mills. It was settled by the French 1745, laid out as Navarino 1830, and as Astor 1835, incorporated 1839, chartered 1854. Pop. (1870) 4,666; (1880) 7,464; (1900) 18,684 (Fort Howard annexed since 1890).

GREEN BUSH, or **EAST ALBANY**: village of Rensselaer co., N. Y.; on the Hudson river opposite Albany, with which it is connected by a bridge; w. terminus of the Boston and Albany railroad, s. terminus of the Troy and G. railroad. It contains a large railroad depot, machine and car-shops, and freight yards, 7 churches, Rom. Cath. convent, 2 saw-mills, tannery, etc. Pop. tp. (1870) 7,072; (1890) 7,301; not separately returned, 1900.

GREENCASTLE: city, cap. of Putnam co., Ind.; near Eel river, at crossing of the Louisville New Albany and Chicago, the Indianapolis and St. Louis and the Terre Haute and Indianapolis railroads; 34 m. e.n.e. of Terre Haute, 38 m. w. by s. of Indianapolis. It is the seat of De Pauw Univ., formerly the Ind. Asbury Univ., established by the Ind. conference of the Meth. Episc. Church 1834, and subsequently renamed in honor of Washington C. De Pauw who gave it nearly \$2,000,000. The Ind. Female College also is located here. G. contains 8 churches, 2 national banks (cap. \$225,000), manufactories of iron, nails, pumps, machinery, and wool, and has valuable timber and sandstone and limestone. Pop. (1870) 3,227; (1880) 3,644; (1890) 4,390; (1900) 3,661.

GREEN CLOTH, BOARD OF: a board connected with the royal household of Great Britain; consisting of the lord steward and inferior officers, which has power to correct offenders within the verge of the palace, and 200 yards beyond the gates. A warrant must be obtained from this board to enable a servant of the palace to be arrested for debt.

GREEN COLORS: various shades of green; producible both in oil and in water-colors, also in dyeing. Most of them, however, are made by mixing the various yellow and blue materials in different proportions. The following are the green paints in use:

Arsenical green, or Scheele's green, an arsenite of copper, made by dissolving arsenious acid in a solution of potash, and adding it to a solution of sulphate of copper. A precipitate is formed, which is *Scheele's green*, or *Mitis green*.

Brunswick green.—The best is crude oxychloride of copper, but the kind commonly sold is a mixture of carbonate of copper and chalk, or pipe-clay. One shade of this mixture is sometimes called *Bremen green*.

Chrome green, mixture of Prussian blue and chrome yellow.

Copper green, sometimes a natural product, but generally manufactured; it is the oxide or the carbonate of copper, and is sometimes called *green bice*, or *mountain green*.

Emerald green, an arsenite of copper, prepared by a slightly different process from *Scheele's green*.

Frise or *Friesland green*, made with sulphate of copper and sal ammoniac.

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Gellart's or Gellert's green, mixture of cobalt blue, flowers of zinc, and chrome yellow.

Sap green—juice of buckthorn-berries fermented for seven or eight days, after which a little alum is added; and when evaporated to a thick consistency, it is pressed into bladders, and hung up until entirely dry. It is employed chiefly in water-colors.

Schweinfurth green, another form of the arsenite of copper produced by dissolving separately equal parts of acetate of copper and arsenious acid: the solutions are then added together quite hot, and the precipitate formed is the beautiful but highly dangerous pigment. Its great beauty has led to its frequent employment in coloring wall-papers, artificial flowers, and even in some cases, it is to be feared, in coloring sugar-confections.

All of these colors, with the exception of sap green, are dangerously poisonous.

Green, in dyeing, is always understood to be a mixture of the two colors blue and yellow. The materials are generally mixed first with blue, afterward with yellow, proportioning the intensity of each to the shade of color required.

The Chinese have a vegetable green color called *luh-kao*, or green indigo, but it is exceedingly costly, and is obtainable in only very small quantities.

GREENE, FRANCIS VINTON: an American military officer; b. in Providence, R. I., 1850, June 27; graduated at U. S. Military Academy 1870; assigned to engineer corps; promoted 1st lieut., 1874; cap., 1883; resigned in 1886. Served as assist. astronomer and surveyor of international commission for survey of n. boundary of U. S. 1872-76; military attaché at U. S. legation in St. Petersburg, 1877-79; served with Russian army in Turkish war; prof. of practical military engineering at U. S. Military Academy 1885-86; was in volunteer army in the war with Spain (1898); was promoted maj.-gen., 1898, Aug. 13, for services at the capture of Manila. In 1902 he was appointed police commissioner of New York city.

GREENE, NATHANAEL: American revolutionary general: 1742, May 27—1786, June 19; b. at Potowhommet, Warwick co., R. I. His father was a leading preacher among the Quakers, and educated his son very simply, training him from childhood to work on his farm, and at his anchor-forge and grist-mill. By perseverance, however, G. acquired considerable knowledge of ancient and English history, geometry, law, and moral and political science; he was also fond of reading books on war. In 1770, he was chosen a member of the Rhode Island assembly, and, to the great scandal of his fellow Quakers, was among the first to engage in the military exercises preparatory to resisting the mother-country. In 1774, he enlisted as private, and in 1775 was appointed to the command of the Rhode Island contingent to the army at Boston, with the rank of brig.gen. He was promoted to

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he maj. gen. 1775, and distinguished himself at the engagements of Trenton and Princeton. At the battle of Brandywine, he commanded a division, and by his skilful movements saved the American army from utter destruction; and at Germantown he commanded the left wing. In 1778, he accepted the office of quarter-master-general. In 1780, he succeeded Gates (q.v.) in the command of the army of the South. Gates had just been completely defeated by Cornwallis, and G. found the army in a wretched state, without discipline, clothing, arms, or spirit. By great activity, he put his army into better condition, and remained on the defensive for the remainder of the year. In 1781, he had a successful skirmish with an English detachment, but drawing on himself the whole army of Cornwallis, much his superior in numbers, he made a masterly and successful retreat. With 5,000 new recruits, he entered upon more active operations, and finally defeated the English at Eutaw Springs, the hardest fought field of the revolution, which put an end to the war in S. Carolina. This battle however is by some deemed a drawn battle, with such generalship on Gen. Greene's part, and with such losses to the British, as gave the effect of an American victory. Congress struck, and presented to him, a medal in honor of this campaign, and the Carolinas and Georgia made him valuable grants of land. When peace was restored 1783, G. returned to R. I. where he received numerous testimonials of public admiration. His exact burial place was long in doubt. In 1901 Col. Asa Bird Gardner, acting for the Rhode Island Society of the Cincinnati, found, in a cemetery vault in Savannah, Ga., the plate of the hero's coffin and 3 buttons of his uniform.

GREENE, RICHARD GLEASON: an American clergyman and editor; b. in East Haddam, Ct., 1829, June 29; educated at Yale Univ.; graduated at Andover Theo. Sem., 1853; ordained to ministry; held pastorates in Congregational churches in Adrian, Mich., Springfield, Mass., and East Orange, N. J. In 1874 was elected by Massachusetts Legislature to preach the annual sermon before the governor and legislature. Was editor-in-chief of 3 cyclopædias, 1875-98; of the *Library of Universal Knowledge*, the *International Cyclopædia*, and the *Columbian Cyclopædia*; and was author of over 200 reviews of books, besides special articles in periodical literature.

GREENE, ROBERT: abt. 1560-1592. Sep. 3; b. Norwich: English poet and dramatist. He was placed at St. John's College, Cambridge, and took his degree A.B. 1578. Returning from travel in Spain and Italy, he re-entered the university, and took his degree A.M. at Clare Hall 1583. He appears to have studied also at Oxford 1588. He went to London, where he supported himself by writing plays and romances. He poured out plays, poems, and novels, ruffled about in silks, wore long hair, and haunted taverns and places of questionable resort with such wild geniuses as Marlowe and Peele. He died of the consequences of a debauch, and was buried next day in the New Churchyard, near Bedlam.

GREENE—GREENGAGE.

GREENE, SAMUEL DANA, U.S.N.: 1839, Feb. 11—1884, Dec. 11; b. Cumberland, Md.: son of Gen. George Sears G. He graduated at the U. S. Naval Acad. 1859, and after a cruise with the China squadron, volunteered for service on the iron-clad *Monitor*. During its fight with the Confederate iron-clad *Merrimac*, 1862, Mar. 9, he had charge of the turret, and personally fired every shot till Commander Worden was disabled, when he took full command of the vessel. He remained on the *Monitor* till she foundered off Hatteras, 1862, Dec. 31. He was commissioned lieut. 1861, lieut. commander 1865, and commander 1872, was asst. prof. of mathematics in the U. S. Naval Acad. 1865-68, of astronomy 1871-75, asst. to the supt. 1878-82, and received the thanks of the R. I. legislature for his services on the *Monitor*.

GREENE, SARAH PRATT (McLean): an American author; b. in Sunbury, Ct., 1856, July; educated at Mt. Holyoke Seminary, Mass.; for several years taught school. She is the author of *Cape Cod Folks*; *Some Other Folks*; *Towhead: a Story of a Girl*; *Lastchance Junction*; *Leon Pontifex*; *Stuart and Bamboo*; *Vesty of the Basins*; *The Moral Imbeciles*, and other stories.

GREENFIELD, grēn'fēld: city, cap. of Franklin co., Mass.; near the w. bank of the Conn. river, 2 m. above the mouth of the Deerfield river, 36 m. n. of Springfield, 46 m. s. of Bellows Falls, 106 m. w. by n. of Boston; at the crossing of the Conn. river and the Vt. and Mass. railroads. It is an attractive place; and contains a courthouse, town-hall, public library, 8 churches, high school, and young ladies' seminary, 3 national banks (cap. \$500-000), 2 savings banks, and a soldier's monument. Its industries are the manufacture of cutlery, edge-tools, clothes, and children's carriages. Pop. of G. tp. (1870) 3,589; (1880) 3,903; (1885) 4,869; (1890) 5,252; (1900) 7,927.

GREEN'FINCH (*Coccothraustes chloris*): bird of the family *Fringillidæ*, common in most parts of Britain, frequenting gardens, orchards, shrubberies, small plantations, tall hedges and cultivated lands; called often *Green Linnet*, sometimes *Green Grosbeak*. It is found even in Scandinavia, but is more common in s. Europe; its range extends throughout Asia to the Pacific Ocean, and w. as far as Madeira. No species is found in America. The bill is much thicker than that of the true linnets, to which it is nearly allied. A prevailing green tint, mingling with gray and brown, characterizes the plumage. The whole length is little more than six inches. The tail is a little forked. The proper song of the G. is not very sweet, but in confinement it readily imitates the song of other birds, and for this, with its very easy domestication, it is a favorite cage-bird.

GREEN'GAGE: variety of plum of green color and roundish shape, the *Reine Claude* of the French; generally esteemed one of the finest varieties in cultivation, perhaps superior to all others. It is not of the largest size, but in delicacy and richness of flavor it is unsurpassed.

GREENHEART—GREENHOUSE.

GREENHEART, or **BEBEERU**, *bē-bē'rō* (*Nectandra Rodiei*): tree of nat. ord. *Lauraceæ*, native of Guiana, of great value as a timber-tree, also yielding a valuable medicinal bark. The timber is commonly called *Greenheart*; the bark is better known as *Bebeeru* (otherwise *Beebeeru*, *Bibiru*, *Bibiri*, etc., and *Sipiri* or *Sipeira*), and the alkaloid to which chiefly it owes its properties is called *Bebeerine* (q.v.). The tree grows mostly in British Guiana, and in the greatest perfection on the low hills behind the alluvial lands; it rises with erect, slightly tapering trunk 40 or 50 ft. without a branch, attaining a height of 80 or 90 ft. in all, and a diameter of 3 or even 4 ft. The wood is extremely strong and hard, and is exported for the same uses as *lignum-vitæ*, which it much resembles. It takes a high polish. It is so heavy as to sink in water. It is remarkable for durability, and for being almost exempt from the attacks of white ants on land, and of the teredo in water. It is used in Guiana for ship-building, and for all the most important purposes for which timber is required.—The bark is hard, heavy, and brittle, with a fracture resembling that of sandstone, has a white epidermis, and is of a bright cinnamon color within. It has a very bitter, somewhat astringent taste. Its tonic and febrifugal properties resemble those of cinchona bark. Instead of the bark itself, the sulphate of bebeerine is generally used in medicine.

S. America produces a number of species of *Nectandra*. *N. Puchury* yields the seeds called *Pitchurum Beans*, which are astringent, are regarded as febrifugal, and are prescribed in dysentery, diarrhea, etc., and the oil of which is used as a substitute for chocolate.

GREENHOUSE: a building in which exotic plants are grown or the development of hardy plants is hastened; formerly devoted to the cultivation of flowers and tender fruits, but now extensively used in market-gardening operations. Both the cold frame and the hot-bed are rude forms of the G. with different methods of heating. The G. is designed to furnish only a mild temperature, not exceeding 65° F. by day, and running 20° lower at night. Buildings in which a higher temperature is required are properly designated hot-houses.

Until recently the ordinary form of a G. was long and narrow. By the improved method now adopted, the width is 20 or 22 ft., instead of 10 or 11 ft. The walls are best made of inch boards, which should be covered with tarred paper and weather-boarded. This form is cheaper and better than brick walls, or walls with a dead air space. The roof is of glass, each sash about six by three ft., with every other one hinged so that one end can be raised to admit air. Heat is supplied by warm air conducted over the building by flues from a furnace, or by hot water circulating through pipes from a boiler. The glass roof furnishes an abundance of light and prevents the escape of heat. The plants are kept either in pots, or in the case of large ones in tubs, or are grown on benches or tables covered with soil to the depth of six to ten inches. The plants will require frequent and liberal watering and constant care to

GREEN ISLAND—GREENLAND.

guard against insect enemies. The temperature must be closely watched, and in the general management of the G. both vigilance and skill will be required. The cost of a G., including heating and ventilating apparatus, should not exceed \$5 per running foot if flues are used, or \$10 if hot water is employed. In many localities the cost will be much below these figures.

GREEN ISLAND: village in Albany co., N. Y.; on an island in the Hudson river between Troy and W. Troy, 6 m. above Albany. It is connected by bridges with Troy and W. Troy, and by street railroads with Troy and Cohoes, and contains 5 churches, car, stove, sash, and blind factories, iron foundries, machine-shops, marble works, etc. Pop. (1880) 4,160; (1890) 4,403; (1900) 4,770.

GREENLAND: region, probably an island, of unknown extent northward, stretching from its s. extremity, Cape Farewell (q.v.), along the Atlantic and Arctic oceans on the e., and Davis' Strait, Baffin's Bay, and Smith's Sound on the w. The w. coast pursues a n.n.w direction as far as Cape Alexander, $78^{\circ} 10'$ n. lat.; it then has a general n.e. direction, gradually changing to e. beyond $82^{\circ} 30'$. Its n. limit is now supposed to be the rocky ice-clad shore of the Polar sea, abt. 83° n. lat. Lieut. Beaumont of the British Arctic Expedition, 1875-76, followed the line of the coast with a sledge party to $82^{\circ} 54'$ n. lat., and $48^{\circ} 33'$ w. long., when the land was beginning to trend southward. It is thus almost proved that G. is entirely distinct from the land on the w. side of Smith's Sound—that in fact G. is an island. Previously our knowledge of the w. coast was derived chiefly from Dr. Kane, who had assigned Cape Alexander, abt. $78^{\circ} 10'$ n. lat., as its termination. G. is said to have been discovered about the close of the 9th c. by an Iclander named Gunbiörn, who named it Hvidsaerk (White Shirt), from its snowy headlands. It obtained the name of G. from another Iclander, Eric Rauði (The Red), who led hither an expedition in 985 or 6, and founded two settlements on the w. coast, called Oestre and Westre Bygd e. and w. colonies. About four centuries afterward the Westre Bygd was destroyed by the pestilence called the 'black death' combined with the attacks of the aborigines; and a century after this, the Oestre Bygd suffered the same fate. G. was visited, and its w. coast explored, successively by Frobisher, Davis, and Baffin, the latter having reached lat. 78° n. (the limit of the inhabited country). Kane touched $82^{\circ} 30'$; Greely (1883) $83^{\circ} 24'$. The e. and s. coasts appear to be so beset with ice as to be practically inaccessible. The former was explored by Scoresby to $74^{\circ} 30'$ n., and two deep inlets were discovered. This coast-land is called by the inhabitants of the other districts Lost Greenland. The interior, a continuous ice-cap, had baffled explorers until Nansen (q.v.) made his excursion across it from the e. to the w. coast 1888-9: see his *Across Greenland* (1890). The great extent of land toward the pole makes the climate colder than in corresponding latitudes further e.—so much so, that in

GREENLAND.

Lapland, lat. 72° n., the temperature is as high as in G., lat. 60° n. From observations made by Dr. Kane, 1853, Sep. —1855, Apr., in lat. $78^{\circ} 37'$ n., long. $70^{\circ} 40'$ w., the average temperature throughout the year is -3.22 ; from Oct. to Apr. inclusive -23.43° ; from May to Sep. inclusive, $+25.07^{\circ}$. The greatest degree of cold was -68° in Feb., and the greatest heat was $+53.9$ in July, the only month in which the average temperature was above freezing-point. During the short summer, which in few places exceeds four months (during two of which, June and July, the sun is always above the horizon), vegetation is very rapid, the plants being for the most part the same as these indigenous to n. Scotland, but dwarfed, the tallest trees not exceeding 18 ft. The inclemency of these regions does not affect the animal kingdom (man excepted). The walrus, seal, polar bear, arctic fox, dog, and reindeer abound, and supply the inhabitants with almost all necessities of life. Black cattle and sheep have been introduced by the missionaries. The sea swarms with different species of cetacea, such as the rorqual, mysticetus, narwhal, porpoise, etc., and of fish, as the cod, salmon, and herring. Sea-fowl are very abundant during the summer; guillemots, sandpipers, plovers, and grouse also are found. The only mineral found in sufficient quantity for exportation is Cryolite (q. v.), which is found at Arksut, and is largely exported. Near the same place are found veins of tin associated with ores of lead, copper, zinc, iron, molybdenum, and with cryolite, fluor-spar, zircon, and other minerals. Copper-ore is said to be abundant in various parts; and gadolinite, sodalite, tourmaline, with garnets, iolite, rock-crystal, etc., are frequent. Good coal is abundant on the island of Disco.

The first settlement was made 1721 by Hans Egede (q. v.) a Norwegian clergyman at Godthaab, who, with 43 colonists, planted a missionary station in this bleak region. This mission, supported by the Danish govt., now has 8 missionary stations; and the Moravians have 5; from Julianehaab, the most southern, to Uppernavik, at the very verge of human existence. In 1874, May, the first native pastor was ordained. The people depend chiefly on the fisheries—the same which have so long attracted so many vessels from Great Britain. The exports are whale and seal oil, and cryolite; the skins of the seal, reindeer, and fox, and eider-down. The imports are wheat, brandy, coffee, sugar, tobacco, and firewood. About 10,000 or 12,000 tons of cryolite are annually exported, half to Denmark and half to the United States. The trade to G. has always been a monopoly in the hands of the Danish government. Each settlement is managed by a trader and his assistant, who are paid by government: and all controlled by a board at Copenhagen. The govt. is administered with economy and justice, and strictly for the good of the people. The people are a simple folk, lacking the vices of a luxurious civilization. Nearly the whole pop. is on the w. coast. The whale fisheries are carried on by the settlers and are for the behoof of the Danish crown. There are

GREEN MOUNTAIN BOYS—GREENOCK.

now 13 different Danish colonies, comprising abt. 60 trading settlements, along abt. a thousand m. of the w. coast of Greenland--7 in North G. (n. of lat. 67° n.), and 6 in South G. At these settlements are collected the products from 176 inhabited places. Pop. (1901) 11,895.

GREEN MOUNTAIN BOYS: association of Vt. men formed in the early part of the revolutionary war for the purpose of seizing Ticonderoga and Crown Point, on Lake Champlain, and the British cannon and military stores there. They numbered 270 and were commanded by Ethan Allen. When they were near the head of Lake Champlain on their march to Ticonderoga, they were met by Benedict Arnold, who as col. in the army demanded the command. Allen refused to give way and his men refused to proceed under any other officer, whereupon Arnold agreed to accompany the expedition as a volunteer. At daybreak 1775, May 10, Allen and Arnold with 83 men crossed the river at Shoreham, opposite Ticonderoga, rushed up the hill to the fort, secured the sentries, and while Allen aroused Capt. Delaplace, the commander, and demanded his immediate surrender, his men captured the entire garrison. Two days afterward Seth Warner, Allen's lieut., took Crown Point. With the subsequent capture of St. John's on the Sorel, the G. M. B. secured a total of 60 prisoners, 200 cannon, and a large supply of gunpowder.

GREEN MOUNTAINS: portion of the Appalachian range (q.v.), covering nearly all of Vermont. The G. M. range begins at West Rock, near New Haven, Conn., passes through the w. parts of Conn. and Mass., takes a middle course in Vt. between Lake Champlain and the Conn. river, and extends to the borders of Canada, between which and the Gulf of St. Lawrence it is known as Notre Dame Hills. The highest points are Mt. Mansfield, 20 m. n.w. of Montpelier, 4,279 ft. above sea level; Camel's Hump, 17. m. w. of Montpelier, 4,188 ft.; Killington Peak, near Rutland, 3,924 ft.; and Ascutney, in Windsor co., near the Conn. river, 3,320 ft. The part in Mass. is locally known as the Hoosac Mountains, and that along the N. Y. line as the Taconic Mountains. Large quantities of marble, iron, and slate, and some of copper and gold are found in the range; and the entire section is rich in timber and grasses.

GREENOCK, *grēn'ok*: parliamentary burgh, market-town, and important seaport of Scotland, county of Renfrew, on the s. bank of the Firth of Clyde, on a narrow strip of shore, and on the slopes of the hills which form its background, 22 m. w.n.w. of Glasgow. It extends more than two m. along the shore, and at one place climbs to a considerable elevation up the face of the hills, which here rapidly rise to 800 ft. Toward the w., and all over the front of the hills, new and elegant villas are continually being erected. From the rising grounds behind the town, and from the w. shore, the view of the opposite coasts of Argyle and Dumbartonshires, fringed with white gleaming villages, and of the Firth stretching away into narrow lochs,

GREENOCKITE—GREENOUGH.

and dotted over, especially in summer, with every variety of craft, is exceedingly picturesque and beautiful. The most important buildings are the custom-house, the exchange, the Watt monument containing a statue of Watt by Chantrey, a museum, a lecture-room, and a library, the Mechanics' Institute, etc. The harbors of G. are on a large scale; the Albert was constructed 1866; and from it extends westward the fine Princes pier, opened 1870. Its quays can be approached by steamers, and its harbors entered by vessels at any tide. The commerce of G. is chiefly with N. America and the W. and E. Indies. The trade is mainly in sugar-refining, for which it has 18 establishments. from some of which about 1,000 tons of refined sugar are turned out in one week. In shipbuilding, about 20 iron vessels are turned off the stocks annually. There are, besides, manufactures of steam-engines, chain-cables, anchors; and rope and sail making. G. has almost constant intercourse with Glasgow by river or railway, and is the general starting-point for tourists *en route* for the Western Highlands and isles. It sends one member to parliament. The number and tonnage of vessels which entered and cleared at the port were returned as follows: (1871) 3,246 vessels, 738,231 tons, entered and cleared; (1880) 12,051 vessels, 2,243,682 tons. The sugar imported (1830) was 18,357 tons; (1840) 22,872 tons; (1850) 45,815 tons; (1860) 74,280 tons; (1871) 213,090 tons; (1881) 182,583 tons. The value of foreign imports (1880) was £5,113,259. Pop. (1871) 57,821; (1881) 66,704; (1889) 78,248; (1901) 67,645.

Originally consisting of only a few thatched houses, G. was created a burgh of barony 1635 (having then pop. less than 2,000), and a parliamentary burgh after the passing of the Reform Act 1832. The prosperity of the town dates from the Union 1707, when free commerce to America and the W. Indies was opened.

GREENOCKITE, n. *grĕn'ók-īt* [after Lord *Greenock*]: a mineral, sulphide of cadmium.

GREENOUGH, *grĕn'ō*, HORATIO: 1805, Sep. 6—1852, Dec. 18; b. Boston: sculptor. He received a public and private school education, and took a partial course at Harvard College, but his all-absorbing interest in art led him to withdraw before graduation and go to Florence and Rome for technical study. Before leaving Harvard he made the design from which Bunker Hill monument was constructed. He reached Rome 1825, and excepting brief trips to Paris and Boston made his permanent residence there. In 1851 he went to Washington to erect a historical group, *The Rescue*, ordered by congress. His works include a bust of Lafayette (1826); colossal statue of Washington, ordered by congress and now in front of the national capitol (1843); marble busts of John Adams, John Quincy Adams, John Jacob Astor, James Fenimore Cooper, Henry Clay, John Marshall, and Josiah Quincy; and ideals, bust of Christ, *Medora*, *Venus*, *Victrix*, the *Angel Abdiel*, *Chanting Cherubs*, *Lucifer*, and *The Graces*.

GREEN'OUGH, RICHARD SALTONSTALL: sculptor: b.

GREENPOINT—GREENS.

Jamaica Plain, Mass., 1819, Apr. 27; brother of Horatio G. He was educated in the Boston Latin School, studied drawing and sculpture with Clavenger, went to Florence to work with his brother, studied in Venice, Ferrara, Bologna, and Florence, 1840–41, and was compelled by ill health to return to Boston. His works include a head of Christ, *Moses and the Daughter of Pharaoh*, *Cupid Warming an Icicle*, *Night Watching a Young Mother*, bronze group *The Shepherd Boy and the Eagle* (Boston Athenæum), bronze statue of Franklin (in School street, Boston), marble statue of Gov. Winthrop (Mt. Auburn Cemetery), *Victory* (memorial to the dead of the civil war, Boston Latin School), and colossal statue of Gov. Winthrop (in Statuary Hall, national capitol).

GREENPOINT (N. Y.): see BROOKLYN.

GREENPORT, *grēn'pōrt*: village, port of entry, Suffolk co., N. Y.; on Shelter Island Sound, between Peconic and Gardiner's bays; 95 m. e. by n. of Brooklyn; e. terminus of the Long Island railroad. It contains 8 churches, 2 national banks (cap. \$100,000), several hotels and boarding-houses, graded and primary schools, and weekly newspapers, 2 shipyards; 3 sets of marine railways, a stereotype foundry, and manufactories of flower pots, wire goods, etc. It has a spacious and completely landlocked harbor, carries on a large coasting and fishing business, is a favorite summer resort. Pop. (1870) 1,819 (1880) 2,370; (1900) 2,366.

GREEN RIVER: river, tributary of the Ohio, rising near the centre of Ky., and flowing through that state; first westward for about 150 m., passing the Mammoth cave; then n.w. for the remainder of its course. It joins the Ohio 9 m. above Evansville, Ind.; and at its mouth is about 600 ft. in breadth. It is more than 300 m. in length, navigable for small steamers 200 m. The lower course of the G. R. is through a country abounding in coal.—The name G. R. is applied to several other streams, mostly small—two in western Mass., one an affluent of the Deerfield and Connecticut; and the other of the Housatonic.

GREEN RIVER: one of the constituents of the Rio Colorado of the West. It rises in the Rocky Mountains, near Fremont's Peak, in the w. part of Wyo. Terr.; flows s., then s.e. through the n.e. corner of Utah, and into the n.w. corner of Colo., turns s.w. and again enters Utah, and flows thence s. till it joins the Grand river, the other constituent. Its entire length is estimated at 500–700 m., of which nearly half is in Utah. It traverses a mountainous country, passes through the Uintah Mountains at Flaming Gorge, just below which the walls of the cañon are nearly 1,500 ft. high, has a swift current and numerous rapids and cataracts, but has no importance for navigation.

GREENS: a term applied somewhat indiscriminately to the leaves of various plants used for food. Among those largely cultivated may be named Collards (grown principally at the South), kale, mustard, spinach, and Swiss chard. Of plants growing wild the cowslip and dandelion are extensively used for G. In cultivation of G. it is es-

GREENSAND.

essential to secure rapid and uninterrupted growth if a good quality is to be secured. The ground must be rich and the surface soil very finely pulverized. During the whole period of growth, weeds must be entirely excluded. Collards and kale are closely allied to the cabbage, and require somewhat similar treatment. Mustard is grown in drills. A sowing should be made every fortnight in order to secure a succession of tender leaves. Spinach is sown early in the fall for spring use, the plants being covered in winter, and in early spring to provide a supply for the summer. Swiss chard is cultivated like the beet, of which it is an ornamental variety.

GREEN SAND: the name given to two divisions of the Cretaceous System (q.v.). They are so called from the occurrence in some of their beds of numerous small green specks of silicate of iron, sometimes so abundant as to give a green color to them. The term is, however, far from being descriptive of the various included strata; it must be considered simply as a name. In some districts, especially on the continent, the green particles are entirely absent from the strata. On this account it has been proposed that the Lower Greensand should be called Neocomian, because strata of this period are well-developed at Neufchatel (Neocomum), in Switzerland. The mineral structure or lithological character of the Upper Greensand is so like that of the Lower, that it is scarcely possible to separate them when the intermediate gault is absent, except by their organic remains, which are very distinct; so much so, indeed, as to have caused the placing of the one series in the Lower Cretaceous group, and the other in the Upper. It should also be noticed that the relative importance of the two divisions is very different; the Lower Greensand includes a series of strata that are of a value nearly equal to the whole Upper Cretaceous group, of which the Upper Greensand is but a subordinate member.

The *Upper Greensand* consists of beds of sand, generally of a green color, with beds and concretionary masses of calcareous grit, called firestone. The strata on the cliffs of the Isle of Wight are 100 feet in thickness. This formation is supposed to have been a littoral deposit on the shores of the Cretaceous seas. While the chalk was being deposited out at sea, these sands were being laid down along the shore, contemporaneous with the chalk, although they appear inferior to it. Their position would necessarily result from the cretaceous sea widening its area, and as the shore submerged, the greensand would be covered with the chalk, and would appear as an older and underlying deposit. The beds of this period are rich in fossils, abounding especially in the remains of sponges, mollusca, and echinodermata.

The *Lower Greensand* consists of a large series of more or less indurated sandstones and clays, with occasional calcareous beds. They attain a thickness of 850 feet. The sands preponderate in the upper, and the clays in the lower portion of the formation. Some beds of clay of considerable thickness, sometimes as much as 60 feet, are used as

GREENSBORO—GREENSHANK.

fuller's earth. The calcareous stone is a highly fossiliferous band of limestone, locally called Kentish rag, much used for building in Kent and Sussex. The formation was formerly known as the iron sand, because of the sands being cemented together by an abundance of oxide of iron; this gives them a reddish color. The Lower Greensand contains numerous fossil mollusca and other marine remains. It is a sea deposit resting on the fresh-water Wealden strata, and showing that at this period the sea made considerable encroachments on the dry land.

GREENSBORO, *grēnz'būr-rūh*: town and cap. of Hale co., Ala.; 50 m. u.w. of Selma, 38 m. s. of Tuscaloosa; on the Selma Marion and Memphis railroad. It is in a rich cotton region and a little n. of the famous canebrake region of ante-bellum days, and contains the Southern Univ., under the auspices of the Ala. conference of the Meth. Episc. Church (founded 1859, and possessing a large library), a female college, normal school, 5 churches, 2 private banks, and weekly newspaper. Pop. (1870) 1,760, (1880) 1,833; (1890) 1,759; (1900) 2,416.

GREENSBORO: city and cap. of Guilford co., N. C., on Richmond and Danville and Cape Fear and Yadkin Valley railroads; 48 m. s.s.w. of Danville. It is in a tobacco, wheat, corn, oats and fruit region; is the seat of Greensboro Female College for white girls, Bennett College for colored youth of both sexes, Guilford College, and the State Agricultural and Mechanical College for colored students; contains gold, copper, and iron mines; has blast furnaces for the manufacture of Bessemer steel; roller, flour, planing, hosiery, and cotton mills, brick, tile, and terra cotta works, foundries and machine shops, etc. The city was named in honor of Gen. Greene, who commanded the Continental army in the battle of Guilford courthouse, fought 5 m. n.w. of Greensboro, 1781, March 15. Pop. (1900) 10,035.

GREENSBURG, a borough and cap. of Westmoreland co., Pa.; on Penn. rr.; 31 m. e.s.e. of Pittsburg. It is in a coal mining, coking, and natural gas region; has 3 nat. banks, steel works, glass works, steam heating apparatus factory, nut and bolt works, an assessed property valuation of over \$4,000,000. Pop. (1890) 4,202; (1900) 6,508.

GREEN'SHANK (*Totanus glottis*): bird of the same genus with the redshank and some of those known as sandpipers, but differing from them in the stronger and slightly recurved bill. It is about the size of a woodcock, but has much longer legs. The bill is about two inches long. The tail is short. The lower part of the tibiae is naked. The plumage is mostly dusky brown on the upper parts, the feathers edged with yellowish white; the under parts are white. Small flocks of this bird are seen on the British coasts in the winter months, and sometimes near inland lakes and marshes. A few remain to breed in the Hebrides and n. Scotland, but the greater number repair to more northern regions. The geographic distribution of the species is extremely wide even for a bird of passage; from

GREEN SNAKE—GREENVILLE.

the arctic parts of Europe, Asia, and (so it is asserted) of America, it extends southward as far as Java and Jamaica. In N. America, the corresponding and very similar species are *T. semipalmatus* and *T. melanoleucus*, known as Willets, Telltales, or Tattlers.

GREEN SNAKE: long, slender snake, common in many parts of the United States. It frequents grassy places, and is quite harmless.

GREEN STONE: variety of trap rock (q.v.), composed of felspar and hornblende, and having generally a greenish color. It has a more or less compact structure—the component crystals in one specimen being scarcely discernible with a pocket-lens, while in another they form a coarse aggregate; and specimens are found exhibiting all the intermediate stages. In the finest they are not so small and compact as in basalt. Its crystalline structure separates G. equally from the earthy tuffs and the glassy pitchstones. It may become porphyritic from a portion of the felspar forming into larger distinct crystals. In weathering, the disintegrating G. assumes a dark-brown color, and exfoliates round limited centres, giving the rock an appearance as if it were composed of a number of large boulders.

GREENVILLE, or **GREENVILLE COURT-HOUSE:** city, cap. of G. co., S. C.; on Reedy river, near Saluda Mountain; on the Atlanta and Richmond Air-Line railroad, and terminus of the G. and Columbia railroad; 95 m. n.w. of Columbia, 160 m. e. of Atlanta. It contains a court-house (in which the U. S. court meets annually), Furman (Bapt.) Univ., a high school that is practically the preparatory dept. of the univ., a female (Bapt.) college, 6 churches, national bank, grain, saw and planing-mills, cotton and coach factories, iron-foundry, and several daily and weekly newspapers. The S. Bapt. Theol. Seminary was organized there 1858, and removed to Louisville, Ky., 1876. Pop. (1870) 2,757; (1880) 6,160; (1890) 8,607; (1900) 11,860.

GREENVILLE: city, cap. of Butler co., Ala.; on the Louisville and Nashville r.r., 45 m. s. of Montgomery. The chief industries are in cotton and timber; there are shingle factories, saw-mills, and boot and shoe factories. The South Alabama Female Institute is situated here, and there is a thriving college. G. has good water-works and street railways. Pop. (1890) 2,806; (1900) 3,162.

GREENVILLE: city, cap. of Washington co., Miss.; on the Mississippi river, and the Richmond and Danville and the Yazoo and Miss. Valley railroads; 100 m. n.n.w. of Jackson. G. is the centre of a large cotton trade; has 2 compresses, 2 oil-mills, saw and planing mills, 3 weekly newspapers, excellent public schools, a fine court-house, etc. Pop. (1880) 2,191; (1890) 6,658; (1900) 7,642.

GREENVILLE: city, cap. of Darke co., O., on Greenville creek, and on the Cincinnati Jackson and Mackinaw, the Dayton and Union, and the Pittsburg Cincinnati Chicago and St. Louis railroads; 35 m. n.w. of Dayton. A fort was built on the site of G. 1793 by Gen. Wayne, who signed a treaty with the Indians there 1795. G. has an

GREENVILLE—GREENWICH.

improved system of water-works, natural gas supplied from wells in Mercer co.; 2 public schools, 11 churches, a Rom. Cath. academy; and 1 daily, 1 monthly, and 7 weekly periodicals. Pop. (1880) 3,535; (1900) 5,501.

GREENVILLE: borough, Mercer co., Penn.; on Shenango river, at the head of Shenango valley; and on the Erie and Pittsburg and the Shenango and Lake Erie railroads. G. has iron-foundries, coal-works, a rolling-mill, woolen mills, and excellent water-power. Thiel Coll. (Evang. Lutheran) is situated here. Pop. (1890) 3,674.

GREENVILLE: a city and cap. of Greenville co., S. C.; on the Southern and Charleston and West Carolina railroads; 153 m. n.w. of Columbia. It is in an agricultural region; is the seat of Furman University, Greenville College for Women, Chicora Female College, Greenville Female College, and a military institute; has 2 nat. banks, Pop. (1890) 5,473; (1900) 5,501.

GREENVILLE: city, cap. of Hunt co., Tex.; on the St. Louis and Southwestern, the Shreveport and Southern, and the Missouri Kansas and Texas railroads; 50 m. n.e. of Dallas. G. is in an agricultural region, has several manufacturing, a large shipping trade, and 1 daily and 4 weekly newspapers. Pop. (1890) 4,330; (1900) 4,814.

GREEN WEED: name of certain half-shrubby species of *Genista*: see **GENISTA**: **BROOM**.—**DYERS' G.** (*G. tinctoria*), species one or two ft. high, with lanceolate leaves, and terminal spiked racemes of pale-yellow flowers, is frequent in woods, meadows, and hilly pastures in most parts of Europe, and in the temperate parts of Asia. Its branches, leaves, and flowers—particularly the flowers—yield a fine yellow dye, used chiefly for wool; its flowers mixed with woad yield a fine green dye. It was formerly in great esteem as a dye-stuff, but others have almost entirely supplanted it. The leaves and seeds were formerly used in medicine; the former as a diuretic, the latter as a mild purgative.—**HAIRY G.** (*G. pilosa*), abundant in some parts of continental Europe, is cultivated in some places, especially in France, as food for sheep, which are very fond of it.

GREENWICH, *grēn'wich*: town of Fairfield co., Conn.; on Long Island Sound and the New York and New Haven railroad; 30 m. n.e. of New York, 40 m. s.w. of New Haven. It is charmingly situated, overlooks Indian Harbor, is close to Round Island, famous for its clam-bakes and fish dinners, has many beautiful residences, and is a favorite summer resort. It contains 15 churches, 19 public schools, an acad., savings bank, several hotels, and weekly newspaper. It was settled about 1640, designated as the w. boundary of Conn. by Dutch and English commissioners 1650, was the scene of Gen. Putnam's thrilling horseback ride down precipitous rocks when pursued by the British 1779, and was the summer rendezvous of the *Americus Club* while the Tweed Ring was at its height of power in New York. The sumptuous club-house has been torn down. Pop. (1870) 7,644; (1880) 7,892; (1900) 12,172.

GREENWICH—GREENWICH HOSPITAL.

GREENWICH, *grin'ij*: parliamentary borough of England, county of Kent, on the right bank of the Thames, 8 m. s.e. of London. It stands partly on an acclivity, but mostly on low marshy ground, portions of which are said to be below the level of the Thames. The older streets are in general narrow and irregular, but those more recently built are spacious and handsome. By far the most interesting institution in G. is the hospital: see **GREENWICH HOSPITAL**. Among important buildings are the Norfolk College, which supports 22 poor inmates and a warden, and of which the Mercer's Company, are the trustees; and the Royal Observatory (see **OBSERVATORY**) in the midst of G. Park, a finely-kept public ground of nearly 200 acres. G. abounds in taverns, and is always a favorite resort of Londoners, but specially so in the 'whitebait' season—April to August. The town contains extensive engineering establishments, iron steamboat-yards, rope-works, and several factories. G. is connected with London by railway, and is a landing-place for all river steamers. Pop. (1881) 206,651; (1891) town only, 46,580; (1901) 95,757.

GREENWICH HOSPITAL: formerly a home for superannuated sailors, was a royal foundation, erected by the munificence of William and Mary, under their letters patent 1694. For many generations a royal palace had occupied the site, and had always been a favorite resort of the sovereign. The buildings were sufficiently completed by 1705 (at a cost of £50,000) to admit 100 disabled seamen. By 1708, July 1, 350 had been admitted; and the income derived from bequests, the original royal grant, and from contributions made under coercion by sailors, amounted to £12,000 a year, half of which was spent in maintaining the seamen, and the remainder in completion of the building. In the reign of George II., the forfeited estates of the Earl of Derwentwater, who had been attainted of high treason, were granted to the hospital, and were computed at £6,000 a year. Till 1834, a compulsory contribution of *6d.* a month was exacted from all seamen, whether of the navy or merchant service, toward the funds of the hospital; but in that year an annual grant of £20,000 from the consolidated fund was substituted. The income from all sources afterward reached nearly £150,000 a year, out of which were maintained governing officers numbering more than 20, with a considerable staff of naval medical officers and nurses, and 1,600 pensioners. The pensioners were lodged, clothed, and fed at the expense of the hospital, and in addition had a small pecuniary allowance for pocket-money weekly. The nurses were usually widows of sailors who had lost their lives in the service.

The question had been frequently raised of late years, whether this superb charity was not, after all, a mistake; and whether the vast revenues would not be bestowed to better advantage in pensions to seamen, who might still find employment in aid of their subsistence, and who might pass the last days of their lives among their descendants and kindred. Under the old rules, the hospital was,

GREENWICH OBSERVATORY—GREET.

so far as the pensioners were concerned, a monastery in which hundreds of men lived together, without any of the soul-sustaining inducements of monasticism. The old men were, on the whole, painful objects to contemplate, wrecks from whom no further good of any description was to be expected. Leading lives useless to themselves and to others, their best occupation was to recount, with the garrulity of age and the boastfulness of self-absorption, the exploits of long ago. Many would have preferred to see them in happy country-homes, kept by pensions from absolute want. The authorities were convinced at last that this semi-monastic life was not good for the old salts. Accordingly, 1865, the institution ceased to exist as an asylum for aged sailors. The funds were converted into *out-pensions*, providing for a larger number than were maintained in the hospital; the old men were relegated to their friends; and the truly noble buildings, after lying vacant for some five years, became a Royal Naval College for officers to acquire naval service.

Attached to the old hospital is a school for gratuitous education of 800 sons of seamen, giving education for three to four years to fit the boys for service in the royal or merchant navy.

In addition to the in-pensioners alluded to above, about 12,000 old or disabled seamen were assisted in their old age by what was called the *Greenwich out-pension*. This, however, is now styled a *Naval pension*: it varies from £3 to £57 a year.

The buildings of G. H. and schools constitute a magnificent series, those of the hospital being among the finest in the kingdom.

GREENWICH OBSERVATORY: see OBSERVATORY.

GREENWOOD LAKE: popular summer resort, in Orange co., N. Y.; and Passaic co., N. J.; 9 m. long., 1½ m. average width, 80–90 ft. deep; 8 m. s.w. of Chester, 50 m. n.w. of New York: on the N. Y. and G. L. railroad. It is nearly surrounded by wild forests, and has parallel ranges of hills rising abruptly from its shores, known on the e. as the Ringwood and Sterling Mountains and on the w. as the Warwick Mountains. The Newark (N. J.) Sanitarium for poor and sick children has been established at G. L., and maintained there each summer, and the American Institute of Christian Philosophy holds its summer schools in an attractive hall in the Warwick woodlands. Hotels and summer residences have sprung up around the lake. G. L. was a small pond 1762 when the London Company built a dam and threw the water back upon the lowlands; and it attained its present size when the Morris and Essex Canal Company by means of a large dam flooded thousands of acres 1836.

GREES, n. plu. *grêz* [see GREE 3]: in *OE.*, steps; stairs: also spelled GRICE, GRISE, GRIZE.

GREET, v. *grêt* [Dut. *groeten*; O.H.G. *grozjan*, to salute: W. *gresaw*, to welcome]: to salute in kindness and respect; to congratulate; to meet and salute; in *OE.*, to address in

GREET—GREGALE.

whatever manner. GREET'ING, imp.: N. a salutation; expression of kindness or joy. GREET'ED, pp. GREET'ER, n. one who.—SYN. of 'greet': to salute; hail; accost; address; compliment.

GREET, or GREIT, n. *grēt* [AS. *grætan*; Icel. *grata*; Goth. *gretan*, to weep]: in *Scot.*, to weep; to shed tears. GREETIN', a. *grēt'in*, shedding tears. GREETIN'-FOW, or -FOU, -fō, that state of partial intoxication which produces a maudlin sentimentality—usually to the shedding of tears.

GREFFIER, n. *grěf'fī-ēr* [F.—from mid. L. *graphiārīus*; Gr. *graphō*, I write]: a registrar or recorder.

GREG, WILLIAM RATHBONE: 1809–1881, Nov. 15; b. Manchester, England: author of several works in literature and politics. He became a commissioner of customs 1856, and acted as controller of her majesty's stationery office 1864–77. He had a conspicuous power of incisive writing, and was interested in philanthropic measures. In his *Rocks Ahead* he took a somewhat dark view of the future of England; and regarded some present tendencies as pregnant with danger; anticipating with sorrow the political supremacy of the lower classes, the approaching industrial decline of England, and the divorce of the intelligence of the country from its religion. His attitude towards evangelical Christianity was strongly skeptical. He was a frequent contributor to the *Pall Mall Gazette*. His works include *The Creed of Christendom* (1851); *Essays on Political and Social Science* (1854); *Literary and Social Judgments* (1869); *Political Problems* (1870); *Enigmas of Life* (1872); *Rocks Ahead, or the Warnings of Cassandra* (1874); *Mistaken Aims* (1876); *Miscellaneous Essays* (2d series, 1884).

GREGAL, n. *grě'gāl* [L. *grēgālīs*, belonging to a herd—from *grex*, a herd: It. *gregale*, belonging to a flock]: in *OE.*, pertaining to a flock.

GREGALE, n. *grě-gāl'* or *grě-gá'lě*: a cold dry n.e. wind blowing over Malta, having an origin similar to the *mistral*, which see.

GREGARINA—GREGARINIDÆ.

GREGARINA, n. *grèg'ă-rî'nă* [L. *gregāriūs*, belonging to a herd or flock—from *grex*, a flock]: a very minute and simple parasite belong to the Protozoa.

GREGARINIDÆ, *grèg-ar-î'nî-dē*: term applied by Leon Dufour to a group of microscopic organisms belonging to the sub-kingdom *Protozoa*, which have been discovered as parasites in the intestinal canal in various invertebrate animals, especially insects, arachnidans and certain chætopodous worms. They seem to have been observed first by Cavolini in the 18th c., but the earliest systematic notice of them is that of Dufour 1828, who gave them their name from the groups in which they occurred.—The principal genus of the G. is *Gregarina*, often called Gregarines.

The form of the body varies: it may be cylindrical, ovate, fusiform, or threadlike. It is often marked by indentations or strictures corresponding to the spot where an internal septum divides the organism into two or more segments. In some, a process projects from one end of the body, or there may be two lateral processes, and to these prolongations minute hooks are attached (see *d* in fig. 1), by which it is supposed that these animals attach themselves

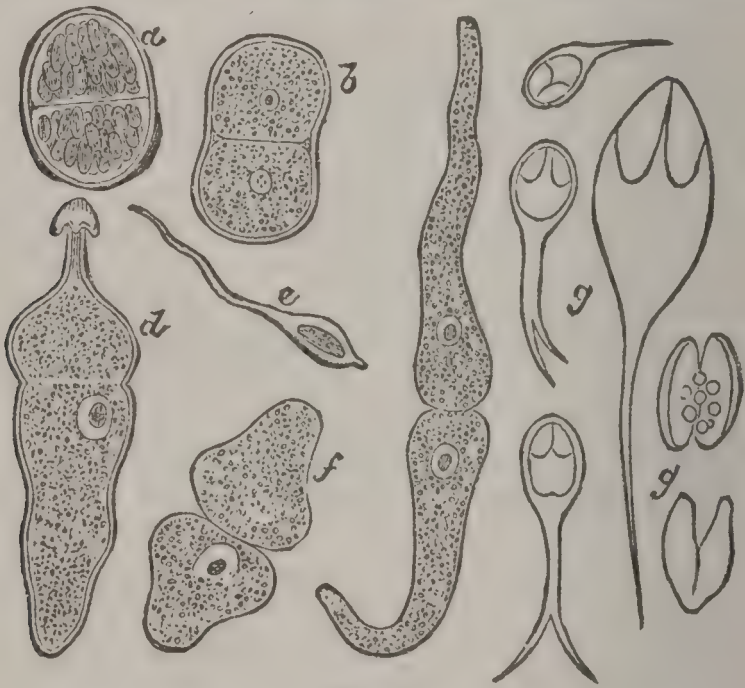


Fig. 1.

c, f, b, a. successive stages of conjugation, the last containing pseudo-naviculæ; *c.* pseudo-navicula; *d.* a dicystidean form; *g.* various psorospermia.—From Greene's *Protozoa*.

to the surfaces on which mostly they are found. Anatomically, the G. consist of an extensible transparent membrane inclosing a granular mass, in which is a nucleus surrounded by a clear space: see CELL THEORY. These organisms are colorless; their locomotive powers seem very limited; and they have neither mouth nor feet.

By a careful observer, under the microscope two of them are seen to come in contact. The surfaces in contact become flattened, and a cyst or capsule forms around them and incloses them (see *f* and *a* in fig. 1). Numerous globular vesicles are then produced in the interior, and these become ulti-

GREGARINIDÆ.

mately metamorphosed into peculiar bodies, termed *pseudo-naviculæ* (*a*, *e*, in the fig). The septum by which the two G. were at first divided, finally disappears; the cyst bursts, and the pseudo-naviculæ escape, and in due time burst also; and thus give rise to bodies closely resembling amœbæ (fig.

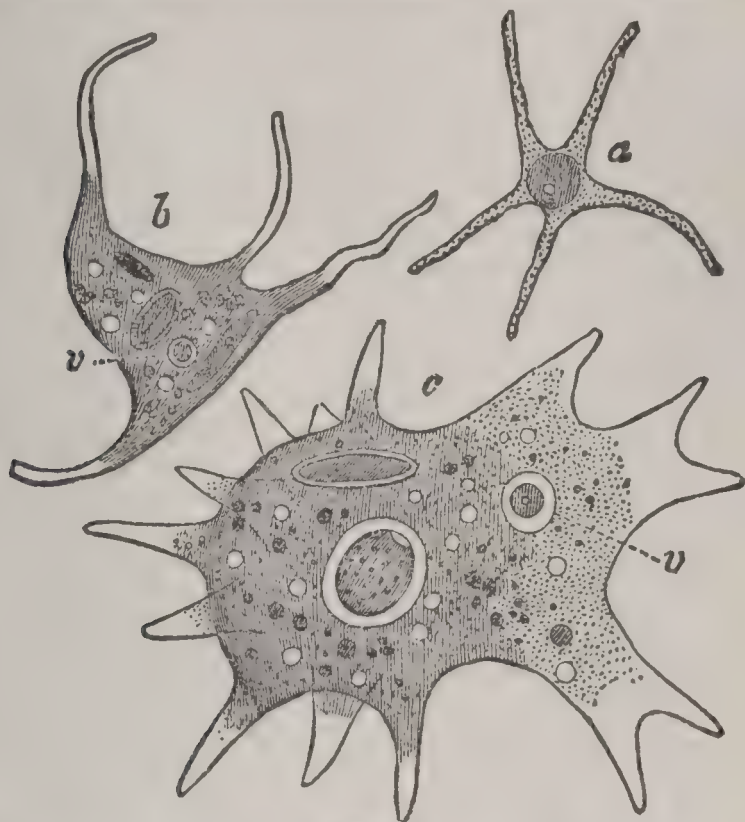


Fig. 2.

a, young amœba; *b*, older specimen; *c*, another form; *v*, a body resembling a nucleus.—From Greene's *Protozoa*.

2). minute animals belonging to the Rhizopoda (q.v.), which at length develop themselves into young gregarinidæ. The coalescence or conjugation of the G. is not positively essential to the formation of pseudo-naviculæ, since they are sometimes seen to occur within the bodies of single animals. E. Van Beneden has described a remarkable form, as much as two-thirds of an inch in length (*G. gigantea*), from the intestine of the lobster. From its pseudo naviculæ, amœbiform embryos arise in the usual manner; but these soon become globular, and then bud out two long processes, of which one is actively contractile, the other still. The former detaches itself, and has a period of separate activity, during which it may be readily mistaken for a nematode worm, and is hence termed a *pseudo-filaria*. Both the pseudo-filaria and the original mass then elongate and stiffen into the adult form.—The G. are conveniently divided into two groups: (*a*) the *Monocystidea*, one-celled, with a central nucleus (see fig. 1, *c*. which shows two conjugating); and (*b*) the *Dicystidea*, spuriously two-celled with a nucleus in the posterior portion (see fig. 1, *d*). (Formerly the G. were by some regarded as infusoria, by others as worms, and by others as vegetable forms.)—Certain other minute organisms, occurring especially in the muscles and viscera of fishes and higher vertebrates, and

GREGARIOUS—GREGOIRE.

known as *Psorospermia* are believed to be embryonic forms (pseudo-naviculæ?) of unknown gregarines. See Huxley, *Anat. of Invertebr. Animals*; Claus, *Zoologie*.

GREGARIOUS, a. *grě-gā'rĭ-ūs* [L. *grĕgāriŭs*, pertaining to a herd—from *grex* or *grĕgem*, a flock: Gael. *greigh*, a flock: It. *gregario*]: having the habit of associating or living in flocks or herds; not living alone. **GREGA'RIOUSLY**, ad. -lĭ. **GREGA'RIOUSNESS**, n.

GREGG, *grĕg*, **DAVID McMURTRIE**: soldier: b. Huntingdon, Penn., 1833, Apr. 10. He graduated at the U. S. Milit. Acad. 1855: was appointed 2d lieut. of dragoons, Sep.; served in Indian campaigns in N. Mex. and Cal. 1858-60; was promoted 1st lieut. 6th U. S. cav. 1861 Mar., and capt. May; appointed col. 8th Penn. cav. 1862, Jan.; brig.gen. of vols. 1862. Nov.; commanded a div. of cav. in army of the Potomac 1862. Dec.—1863, June, and the 2d cav. div. in the Richmond campaign 1864, Apr.—1865, Feb.; brevetted maj.gen. of vols. 1864, Aug. 1; and resigned 1865, Feb. 3. In 1874 he became U. S. consul at Prague, and 1886 commander of the military order of the Loyal Legion for Pennsylvania.

GREGG, **JOHN IRVIN**: soldier: b. Bellefonte, Penn., 1826, July 19. In 1846, Dec. he enlisted as a private for the Mexican war; 1847. Feb., was appointed 1st lieut. 11th U. S. inf., and Sep. promoted capt.; and after serving through the war was mustered out 1848, Aug. 14. He was appointed capt. 6th U. S. cav. 1861, May, and col. 16th Penn. cav. 1862, Oct., and commanded a cav. brigade in the army of the Potomac 1863, Apr.—1865, Apr. He participated in all the great movements of that army was brevetted maj., lieut.col., col., and brig.gen. U. S. A., and maj.gen. of vols., became inspector-gen. of freedmen in La. after the war, was promoted col. 8th U. S. cav. 1866, and retired 1869. He d. 1892, Jan. 6.

GREGGOE, n. *grĕg'gō*, or **GREGO**, or **GRIEGO**, *grĕ'gō* [Port. *grego*; It. *greco*; Sp. *griego*, Greek]: a short jacket or cloak, with a hood attached, made of thick coarse cloth, and worn by the Greeks and others in the Levant.

GREGOIRE, *grā-gwār'*, **HENRI**: the most remarkable of the so-called 'constitutional' bishops of France: 1750, Dec. 4—1831, May 23; b. at Vebo, near Luneville; of poor parents. Having received his education from the Jesuits at Nancy, he entered priest's orders, and for some time held a professorship at the Jesuit College of Pont-à-Mousson. He published 1778, *Amelioration of the Condition of the Jews*, which attracted considerable notice, was translated into English, and crowned by the Royal Soc. of Metz. G., soon after his ordination, was appointed curé of Embermesnil, in Lorraine; and at the election for the states-general 1789, he was chosen one of the deputies of the clergy. An ardent democrat in all his views, he attached himself from the first to the Tiers-état party, and was prominent in the subsequent drama; he was one of the chief advisers of the secession, took the oath of the Tennis Court with the rest, and supported the Abbé Sieyès

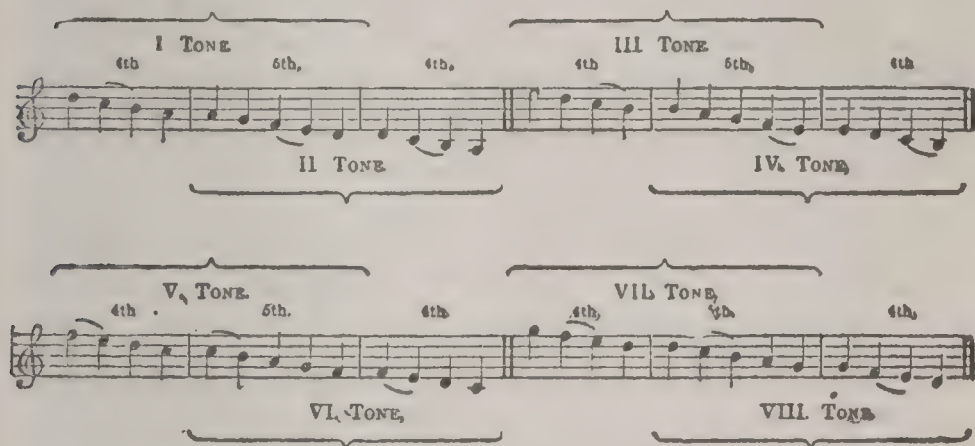
in the proposal for constituting the seceders into the national assembly, of which he became one of the secretaries. From that time G. pursued his course without hesitation. He was one of the most enthusiastic on occasion of the famous session of the night of Aug. 4, in the abolition and renunciation of the privileges of the nobles and clergy. G. carried into every department the stern democracy to which he was devoted, and which he identified with the Christian brotherhood of the gospel. He was always sincere, tolerant, consistent. Upon the fundamental doctrine of the Revolution—the ‘rights of man’—he sought to ingraft his own early advocacy of the Jews and of the negroes. Carrying the same views into questions of church-polity, he was a zealous supporter of the civil constitution of the clergy, was the first of his order to take the oaths, and was elected the first ‘constitutional bishop’ of the dept. of Loir-et-Cher. He was chosen for two places, but accepted this, though the old and legitimate bishop, Monseigneur de Themines, was still alive. When at the blasphemous Feast of Reason, the miserable Gobel, constitutional Bishop of Paris, having publicly renounced Christianity, a similar renunciation was demanded from G. by the infuriated rabble, he firmly confronted the danger, and refused. Through the later phases of the Revolution, under the directory, G. continued to take a part in public affairs; and to his interference are due many of the measures connected with literature and science, which still bear fruit in the French system of administration. After the 18th Brumaire, he became a member of the corps legislatif. His extreme republicanism was highly distasteful to Bonaparte, and it was only after a third attempt that he was appointed member of the senate. On the conclusion of the concordat between Pius VII. and Bonaparte, he ceased to exercise ecclesiastical functions, as he could not be induced to give the retractations which the church authorities required. True to his old principles, he resisted every step toward the establishment of the absolute authority of Napoleon; and, in 1814, he was one of the first to pronounce against the empire. On the restoration, he was one of the most earnest in demanding from the king the acceptance of the constitution. During ‘the Hundred Days,’ he attracted no notice; but after the return of the king, he was excluded from the senate, and ceased thenceforth to hold any public place. During this enforced retirement, and in the intervals of leisure in his earlier political life, he published several works, literary, religious, political, historical, and polemical, the most voluminous of which are a *Cronique Religieuse*, 6 vols. and a *Histoire des Sectes Religieuses*, 6 vols., but incomplete. When he was on his death-bed, an effort was made by the Abp. of Paris to induce him to express his regret for the uncanonical and schismatical proceedings of his early career; but he persistently declined to make any retraction, and the abp. directed that the last rites of the church should be withheld. Nevertheless, the last sacraments were administered to G. by the Abbé Guillon.

GREGORIAN—GREGORIAN CHANT.

GREGORIAN, a. *grě-gō'rě-ăn*: denoting what pertains to Gregory, the name of several popes. GREGORIAN CALENDAR AND YEAR, the calendar as reformed by Pope Gregory XIII, 1582 (see CALENDAR).

GREGO'RIAN CHANT, or GREGORIAN TONES: a class of choral melodies introduced into the service of the early Christian Church by Pope Gregory the Great, near the end of the 6th c. The music of the church in earlier times was founded on the Greek system as far as it could be used, which was improved from time to time, until St. Ambrose, Bp. of Milan, 4th c., invented the AMBROSIAN CHANT: see AMBROSIAN CHANT. In 599. Pope Gregory began to reform and improve the music of the church at Rome, by discarding the Greek tetrachord, or scale, on the basis of a fourth, and in its place substituting the scale of the octave, which some writers say he named by the letters of the alphabet, while others say he had a peculiar set of signs called *nota Romana*, consisting partly of words with points, strokes, and other marks, which sufficiently served his purpose. To the authentic modes of Ambrosius, Gregory added the plagal, which began with the fourth below, and thus he completed the octave. He retained the four most useful modes of the Ambrosian chant, termed the *Dorian*, *Phrygian*, *Lydian*, and *Mixolydian*, supposed to have been obtained from the ancient Greeks. At first Gregory's improvement was called the *Roman chant*, but later it got the name of *cantum planum* ('plain song'—q.v.) or *firmum*, as it was originally sung in unison, and in notes all of the same length. At a later period, the letters of the Roman, as well as of the Greek alphabet, were used to express the notes of the G. C., but without any general fixed order or rule. In course of time, the system of notation on lines and spaces came into use; but at first only four lines were used, on which we find all the old examples of the G. C. written. By the Gregorian tones, or modes (*toni*, *modi*) of Gregory, must be understood a certain melodious formula, made out of the union of a perfect fifth and a perfect fourth, or their inversion, to give the church-song greater variety. All the old writers agree as to the diatonic genus of the Gregorian tones, but they do not all agree as to the number of the tones; some counting 14, others 12, while in some old Roman choral-books we find only 11. The foundation of the system of the Gregorian tones may be explained thus: As there are seven notes from *a* to *g*, there should be at least seven different modes, or tone-systems, varying from each other according to the position of the semitones; but as the first or key-note of each mode might be the first note, or might be in the middle, the same scale could therefore, as it were, be viewed from two sides, which gave rise to the 14 system of tones. It was, however, found that two of those were at variance with a fundamental rule of church-song—viz., that every mode or scale must possess a perfect fifth or perfect fourth; and that the modes containing a false fifth from *b* natural to *f* natural, or a false fourth from *f* to *b*, could not be used, and on account of the dissonant character

of these intervals, must be rejected. This reduced the number of the tones to 12. It was further found that as four of the 12 were merely transpositions of some of the others, there were really only eight, and that they were in every respect sufficient for all purposes of church-song. The eight Gregorian tones, as they are handed down to us, were in time fixed by a royal mandate of Charles the Great—*octo toni sufficere videntur*. The following example in modern notation in the G. clef shows the position of the eight Gregorian tones:



There cannot be a doubt that Pope Gregory greatly improved the church-music at the time, and that the eight tones have always been ascribed to him. That they are of great antiquity is certain, for we find them mentioned in a treatise on choral singing by one Aurelian, 9th c. The different character of the Gregorian tones depends entirely on the places of the semitones, which in the above example are marked ◄. Several of the tones have various endings, some as many as four, while the second, fifth, and sixth tones have each only one ending. For a full and interesting account of the Gregorian church-music, see N. A. Janssen's *Grundregeln des Gregorianschen Kirchengesanges*, pub. by Schott, Mainz 1846.

GREGOROVIVS, *grā-gō-rō'vē-ūs*, FERDINAND: German historian: b. in East Prussia, 1821. He studied for the clerical profession, at Königsberg, but soon turned to poetry and literature. In 1852 he went to Rome, where he has subsequently spent most of his time. His great work is the *History of the City of Rome in the Middle Ages* (8 vols. 1859-72; 3d ed 1875) He has written also on Italian geography and history, on Corsica, on the graves of the popes, and on Lucrezia Borgia.

GREGORY, *grĕg'o-rĭ*, THE GREAT (Saint), Pope of Rome: one of the four Doctors of the Latin Church (Ambrose, Augustine, and Jerome, the other three): abt. 540-604, Mar. 12 (pope 590-604); b. Rome; of an illustrious Roman family. He was the first of 16 popes of this name. His father, Gordianus, was a senator, and one of the earlier pontiffs; Felix III. had belonged to the same family. At a comparatively early age G. was named by Emperor Justin II. to the important charge of prætor of Rome; but he voluntarily relinquished this office, and withdrew, prob. abt. 575, from the world into St. Andrew's monastery which he had founded in Rome. This was but one of many such acts of religious munificence; 'He founded and endowed,' says Dean Milman, 'six monasteries in Sicily.' Before entering the Roman convent, equally founded by himself, which he chose for his own retreat, 'he lavished on the poor all his costly robes, his silk, his gold, his jewels, his furniture, and not even assuming to himself the abbacy of his convent, but beginning with the lowest monastic duties, he devoted himself altogether to God.' He was elected abbot of his monastery, and while he was in this office, the well-known incident befell of his meeting the Anglo-Saxon youths in the slave-market, and on being struck by their beauty, and learning that they came from a pagan land, resolving to devote himself to the conversion of that land to Christianity. He set forth on his journey, but the clamor of the Romans at his loss led the pope Benedict to compel his return, and eventually to enroll him in the secular ministry by ordaining him one of the seven regionary deacons of Rome. Benedict's successor, Pelagius II., sent G. as nuncio to Constantinople, to implore the emperor's aid against the Lombards. He resided three years in Constantinople, during which time he commenced, and perhaps completed, his great work, *Exposition of Job*. Returning to Rome he resumed his place as abbot, and on the death of Pelagius, in a plague which laid waste the city, G. was unanimously called by the clergy, the senate, and the people to the papal chair. He used all means to evade the dignity, even to a petition to Emperor Maurice to withhold his consent; but he was forced to yield, and was consecrated 590, Sep. 3. Few pontiffs have equalled, hardly one has surpassed G. as the administrator of the multiplied concerns of the vast charge. 'Nothing,' says Dean Milman, 'seems too great, nothing too insignificant for his earnest personal solicitude; from the most minute point in the ritual, or regulations about the papal farms in Sicily, he passes to the conversion of Britain, the extirpation of simony among the clergy of Gaul, negotiations with the armed conquerors of Italy, the revolutions of the Eastern Empire, the title of Universal Bishop usurped by John of Constantinople' (*Latin Christianity*, I. 439). There is no department of ecclesiastical administration in which he has not left marks of his energy and his greatness. To him the Roman Church is indebted for the complete and consistent organization of her public services and the details of her ritual, for the regulation and systematization of her sacred chants. The

GREGORY II.

mission to England, which he was not permitted to undertake in person, was intrusted by him, with all the zeal of a personal obligation, to Augustine: see AUGUSTINE, SAINT (Abp. of Canterbury); and, under his auspices, Britain was brought within the pale of Christian Europe. Under him the Gothic kingdom of Spain, long Arian, was united to the church. Nor was his zeal for the reformation of the clergy, and in purifying of the morality of the church, inferior to his ardor for its extension. His letters, numerous and interesting, are full of evidences of the universality of his vigilance. On occasion of the threatened invasion of Rome by the Lombards, G. is declared by Milman to have 'exercised the real power by performing the protecting part of a sovereign;' and in his general administration, to have been 'in act and in influence, if not as yet in avowed authority, a temporal sovereign.' Against the memory of his administration of Rome a charge was formerly made, that in his zeal against paganism he destroyed the ancient temples and other buildings of the pagan city; but Gibbon confesses that the evidence 'is recent and uncertain;' and, indeed, the only authority to which Gibbon himself refers, Platina, mentions the charge in order to repudiate it. The same, according to Milman, may be said of 'the fable of his having burned the Palatine Library in his hatred of pagan literature, which fable is now rejected.' As regards the general government of the church, G. reprobated very strongly the assumption by John, patriarch of Constantinople, of the title of Ecumenical or Universal Bishop; especially, as the object of John in assuming this title was to justify an exercise of jurisdiction outside the limits of his own patriarchate. In G.'s writings, too, the details of the whole dogmatical system of the modern church are very fully developed. His works fill four folio vols. His *Letters*, and, still more, his *Dialogues*, abound with miraculous and legendary narratives, which show his lack both of critical acumen and of literary taste. G., with all his zeal for the uniformity of the Roman ritual and the ascendancy of the Roman hierarchy, and the prevalence of the dogmas of his church, was most gentle in his treatment of heathens and Jews; and he used all his efforts to repress slave-dealing, and to mitigate the severity of slavery.

GREGORY II., SAINT, Pope of Rome: of Roman birth; d. 731 (pope 715 or 716-731). His pontificate is noticeable as forming an epoch in the progress of the territorial pre-eminence of the Roman see in Italy. The eastern emperors having almost utterly abandoned the government, and, still more, the defense of Italy, and the aggressions of the Lombards becoming every year more formidable, the imperial authority in the west sank into little more than a name; and the tyrannical and barbarous measures by which Emperor Leo, the Isaurian, attempted to enforce his decrees against image-worship, weakened still more the tie which bound Italy to the eastern emperors. The natural result of the diminution of the imperial authority in Italy was the growth of that of the pope, to whom the deserted Italian provinces looked, partly as their spiritual counselor

GREGORY III.—GREGORY VII.

and head, partly as their mediator with the barbarous enemy, partly as the centre of the political federation for self-defense which their very isolation necessitated. G. convened a council in Rome on the subject of the honor due to images, and addressed a very energetic letter to the emperor, protesting against the sacrilegious outrages of which he had been guilty, explaining and defending the Rom. Cath. doctrine on image-worship, and warning the emperor that the feelings of his subjects were so completely alienated by his conduct, that it was only the pope's influence which prevented them from throwing off all allegiance. G. has been accused of himself fomenting this disaffection. The contrary, however, is attested, not only by G.'s own letters, but also by Paul the Deacon, in his *History of the Lombards* (book vi. c. 39); and it is certain that the circumstances themselves, and the well-known character of the emperor, would sufficiently explain any degree of discontent in Italy. At all events, the result of the contest was a most notable aggrandisement of the political authority and influence of the popes in Italy.

GREGORY III., SAINT, Pope of Rome: b. Syria; d. 741, Nov. 29 (pope 731-741). The encroachments of the Lombards in Italy during his pontificate became so formidable, that as the eastern emperors still remained powerless or indifferent to the protection of the Italian provinces, the Romans charged G. to send a deputation to Charles Martel, soliciting his succor against the enemy, and proposing, on that condition to recognize him as their protector, and to confer on him the title of consul and patrician of Rome. This offer was made by the pope 'in virtue of a decree of the Roman primus,' and is of great historical importance in the consideration of the nature and origin of the papal power in Italy. The embassy failed, owing to the pressure of his war with the Saracens, to enlist the aid of Charles; but it was a step toward the consummation of the independence of the West.

GREGORY VII., SAINT (HILDEBRAND), Pope of Rome: abt. 1015-1085, May 25 (pope 1073-1085); b. Saona, a village in the s. border of Tuscany: pre-eminent historical representative of the temporal claims of the mediæval papacy. Whether his family belonged to the burgher or the noble class, is disputed by his biographers. His family name, Hildebrand, would imply a Teutonic descent; but by birth and education, at least, he was Italian. His youth was passed at Rome, in the monastery of St. Mary on the Aventine, of which his uncle, Laurence (afterward Bp. of Amalfi), was abbot. From Rome, he passed into France, where he entered the celebrated monastery of Cluny, in the schools of which he completed his education; and from the strict ascetic observances there practiced by him he acquired those habits of austerity which distinguished his entire life. He visited the court of Henry III., and obtained by his preaching the reputation of great eloquence. On his return to Rome, he became the chaplain of Gregory VI., but after the death of that pontiff, he again withdrew

GREGORY VII.

to his former retreat at Cluny, from which he was recalled only by the earnest appeal of the new and zealous pope, Leo IX., whom he accompanied to Rome 1049. Under this active and devoted pontiff, Hildebrand exercised great influence. He now, for the first time, entered into holy orders, and was eventually created cardinal. Besides the important domestic employments which were assigned to him, he was sent as legate to the important council of Tours, in which the cause of Berengar was examined. Under all the short but important pontificates of the successors of Leo IX., known in history as the German popes—Victor II., Stephen IX., Benedict X., and Alexander II.—Hildebrand continued to exercise the same influence, and by inspiring into their government of the church the great principles to which his life was vowed, he prepared the way for the full development of his own theory of the papacy. He was unanimously elected at Rome, without awaiting the imperial authorization, three days after the death of Alexander II. The German bishops, who feared the strong arm of those reforms of which his name was a guarantee, endeavored to prevent Emperor Henry IV. from assenting to the election; but Henry gave his approval, and the new pope was crowned, 1073, July 10. From the date of his election, the pontificate of G. was one long struggle for the assertion of the principles with which he believed the welfare of the church and the regeneration of society itself to be inseparably bound up. Regarding as the great evil of his time the thoroughly secularized condition of the church in a great part of Europe, especially in Germany and n. Italy, he directed against this all his efforts. The position occupied by the higher clergy as feudal proprietors, the right of investiture with the temporalities of benefices claimed by the crown, the consequent dependence of the clergy upon the sovereign, and the temptation to simony (see SIMONY) which it involved, were, in the mind of G., the cause of all the evils under which Europe was groaning; and of all these he regarded investiture (see INVESTITURE) as the source. While, therefore, he labored by every species of enactment, by visitations, by encyclical letters, and by personal exhortations, precepts, and censures, to enforce the observance of all the details of discipline—celibacy, the residence of the clergy, the instruction of the people—and to repress simony and pluralism, it was against the fundamental abuse of investiture that his main efforts were directed. In the year after his election, he prohibited this practice, under pain of excommunication both for the investor and the invested. and in the following year he actually issued that sentence against several bishops and councilors of the empire. Emperor Henry IV. (see HENRY IV.), disregarding these menaces, and taking the offending bishops under his protection, G. cited him to Rome, to answer for his conduct. Henry's sole reply was a haughty defiance; and in a diet at Worms 1076, he formally declared G. deposed from the pontificate. G. was not slow to retaliate by a sentence of excommunication; and in this

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sentence, unless revoked or removed by absolution in twelve months, by the law of the empire at the time, was involved the forfeiture of all civil rights, and deposition from every civil and political office. Henry's discontented Saxon subjects appealing to this law against him, he was compelled to yield, and, by a humiliating penance, to which he submitted at Canossa, 1077, Jan., he obtained absolution from the pope in person. This submission, however, was but feigned; and on his subsequent triumph over his rival, Rudolf of Swabia, Henry resumed hostilities with the pope, and in 1080 again declared him deposed, and caused to be appointed in his place the antipope Guibert, Abp. of Ravenna, under the title Clement III. After a protracted siege of three years, Henry, 1084, took possession of Rome. G. shut himself up in the castle of St. Angelo. When G. was on the point of falling into his enemy's hands, Robert Guiscard, Norman Duke of Apulia, entered the city, set G. free, and compelled Henry to return to Germany; but the wretched condition to which Rome was reduced obliged G. to withdraw first to Monte Cassino, and ultimately to Salerno, where he died. His dying words are a deeply affecting, but yet a stern and unbending profession of the faith of his whole life, and of the profound convictions under which even his enemies acknowledge him to have acted: 'I have loved righteousness and hated iniquity; therefore I die an exile.' The character of G. VII., and the theory of church-polity which he represents, are differently judged by the different religious schools; but his theory is confessed by all, even those who most strongly reprobate it as an excess, to have been grand in its conception, and unselfish in its object. 'The theory of Augustine's city of God,' says Milman, 'no doubt swam before his mind, on which a new Rome was to rise, and rule the world by religion.' In his conception of the constitution of Christian society, the spiritual power was the first and highest element. It was to direct, to command the temporal, and, in a certain sense, to compel its obedience; but as the theory is explained by Fénelon, by Gosselin, and other modern Rom. Catholics, the arms which it was authorized to use for the purpose of coercion were the arms of the spirit only. It could compel by penalties, but these penalties were only the censures of the church; and if, in certain circumstances, temporal forfeitures (as in the case of Henry IV.) were annexed to these censures, this, it is argued, was the result of the civil legislation of the particular country, not of any general ecclesiastical law. Thus, in the case of Henry, the imperial crown was forfeited, according to the Swabian code, by the mere fact of the emperor's remaining 12 months under excommunication without obtaining absolution from the sentence. Moreover, whatever may be said of the power in itself, or of the lengths to which it has at times extended, the occasion and the object of its exercise in the hands of G. were always such as to command the sympathy of the philosophical student of the history of the middle age. By his firm and unbending efforts

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to suppress the unchristian vices which deformed society, and to restrain the tyranny which oppressed the people as much as it enslaved the church, he taught his age 'that there was a being on earth whose special duty it was to defend the defenseless, to succor the succorless, to afford a refuge to the widow and orphan, and to be the guardian of the poor.' Dean Milman sums up his history of G. as of one who is to be contemplated not merely with reverence but in some respects, and with some great drawbacks, as a benefactor of mankind.—See Milman's *Latin Christianity*, III.; Bowden's *Life of Gregory VII.* (1840); Voigt's *Hildebrand als Papst*; Villemain's (1872) and Langeron's (1874) lives of G.

GREGORY XIII. (UGO BUONCOMPAGNO), Pope of Rome: 1502, Feb. 7—1585, Apr. 10 (pope 1572–85); b. Bologna. He was educated in his native city, where he held the professorship of law for several years. He settled at Rome 1539, was distinguished by several important employments, and was one of the theologians of the council of Trent. On his return from Trent he was created cardinal 1564, and sent as legate to Spain. On the death of Pius V., G. was elected pope. Not one among the post-reformation pontiffs has surpassed G. in zeal for the promotion and improvement of education; a large proportion of the colleges in Rome were wholly or in part endowed by him; and his expenditure for educational purposes is said to have exceeded 2,000,000 Roman crowns. An important event of his pontificate is the correction of the calendar (see CALENDAR), the result of long consideration, made public 1582. A grievous imputation rests on the memory of G. from his having ordered a *Te Deum* in Rome on occasion of the massacre of St. Bartholomew (see ST. BARTHOLOMEW); though in justice it must be said, that this was done on the report of the French ambassador, which represented that bloody event, not as a deliberate aggression on the part of the Rom. Catholics, but simply as the suppression of a baffled Huguenot conspiracy. G. published a valuable edition of the *Decretum Gratiani* with learned notes.

GREGORY XVI. (BARTOLOMMEO ALBERTO CAPPELLARI), Pope of Rome: 1765, Sep. 18—1846, June 1 (pope 1831–46); b. Belluno, Italy. He entered the order of Camaldolese monks under the name of Mauro 1783; became noted for his theological acquirements and proficiency in oriental languages; published a controversial work against the Italian Janseivists, *Il Trionfo della Santa Sede e della Chiesa*, 1799; was elected a member of the Acad. of the Cath. Religion in Rome 1801; became a censor of the acad., vice-procurator-gen. of his order, and abbot of his monastery in Rome, 1807; and retired to the monastery of St. Michael at Murano after the abduction of Pius VII, 1809. On the restoration of the pope he was recalled to Rome and appointed procurator-gen. and vicar-gen. of his order, consistor of the Propaganda, and commissary for examining works on oriental liturgical literature. He be-

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came cardinal-priest and prefect of the Propaganda 1826, and after a 50-days' conclave was elected pope 1831, Feb. 2. He greatly extended the sway and power of the Rom. Cath. Church, and stimulated the study of the sciences and arts. G. was succeeded as pope by Pius IX.

GREG'ORY, DANIEL SEELY, D.D.; 1832, Aug. 21—
—————; b. Carmel, N. Y.; minister, author, and editor. He graduated at the Coll. of N. J., 1857, and at Princeton Theol. Sem. 1860; was tutor of rhetoric and belles lettres in the Coll. of N. J., 1858-60; Presb. pastor at Galena, Ill., 1860; Troy, N. Y., 1863; New Haven, Conn., 1866; and South Salem, N. Y., 1869. He became prof. of metaphysics and logic in Wooster Univ., O., 1871, and of mental science and Eng. literature, 1875; pres. of Lake Forest Univ., Ill., 1878-86. Removing to New York, he was managing editor of the *Standard Dictionary*, 1890-94, and editor of the *Homiletic Review* in 1895. Among his published works are *Christian Ethics* (1875); *The Key to the Gospels; or, Why Four Gospels?* (1876); *Practical Logic* (1881); *Christ's Trumpet-call to the Ministry, etc.* (1896).

GREG'ORY, DAVID: 1661-1708; b. Aberdeen; son of David G. of Kinardie. He was educated at Aberdeen and at Edinburgh schools. In 1691, through the friendship of Newton and Flamsteed, he obtained the vacant Savilian professorship of astronomy at Oxford, for which the illustrious Halley was a competitor. Halley, however, soon obtained the professorship of geometry in the same univ., and became a great friend and fellow-worker of G.

Among Dr. G.'s works were: *Exercitatio Geometrica de Dimensione Figurarum* (Edin. 1684); *Catoptrica et Dioptrica Sphaerica Elementa* (Oxford, 1695), the substance of his Edinburgh lectures in which Dr. Hutton thinks there is an anticipation of Dolland's achromatic telescope; *Astronomiae Physicae et Geometricae Elementa*, Oxford 1702; and an edition of Euclid in Greek and Latin, highly valued, 1703. Toward the end of his life he worked with Dr. Halley on an edition of the *Conics of Apollonius*. He was the first who considered the Catenary, on which he left a paper in ms., besides a short treatise of the *Nature and Arithmetic of Logarithms*; a treatise on *Practical Geometry*, published 1745 by Maclaurin; and many memoirs in the *Phil. Trans.*, XVIII—XXV.

Of his four sons, the eldest, DAVID G., became regius prof. of modern history at Oxford, and Dean of Christ's Church.—When Dr. David G. (the father) removed to Oxford, he was succeeded, 1691, in the Edinburgh chair, by his brother JAMES (son of David G. of Kinardie), who filled it 33 years, when he retired, and gave place 1725 to Maclaurin.—Another brother, CHARLES G., was prof. of mathematics at St. Andrews 1707-39, and was succeeded by his son, DAVID G., who died 1763.—The three sons of David G. of Kinardie were thus, at the same time, professors of mathematics in three universities, and two of them left sons who obtained professorships. Dr. Thomas Reid, of

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Glasgow, was nephew, through his mother, of these illustrious brothers. Altogether, it is said (Chalmers's *Biographical Dictionary*, p. 289) that no less than 16 members of this family have held British professorships.

GREGORY, FRANCIS HOYT: 1789, Oct. 9—1866, Oct. 4; b. Norwalk, Conn.: naval officer. He was bred to the sea, served on a merchantman 1807–9, was appointed midshipman U.S.N. 1809, commissioned lieut. 1814, commander 1828, capt. 1838, and retired as rear admiral 1862, July 16. He served with Com. Chauncey on the lakes 1812–14; was taken prisoner 1814, Aug., and confined 14 months in England; made several notable captures of pirates in the W. Indies and Gulf of Mexico; was on blockading duty during the Mexican war; and was supt. of the construction of all war vessels outside the navy yards from 1861, July, till his death.

GREGORY, JAMES: 1638–75: b. Aberdeen; of a Scotch family distinguished in the history of science; son of the Rev. John G., minister of Drumoak, Aberdeenshire. He studied at Marischal College, and betook himself to optical science, in which he made his first discoveries. At the age of 24, he invented the reflecting-telescope known by his name, and described in his work *Optica Promota*. In 1664 or 1665, he went to London with a view to the construction of his telescope; but finding the artists lacking in skill, he passed on to the Univ. of Padua, where he applied himself to study; and 1667, produced *Vera circuli et Hyperbolæ Quadratura*; followed, 1668, by *Geometriæ Pars Universalis*, and *Exercitationes Geometricæ*. These works led him into correspondence with the greatest mathematicians of the age—Newton, Huyghens, Wallis, etc. Returning to London, he was elected a fellow of the Royal Soc.; and 1669 he obtained the professorship of mathematics at St. Andrews. There, 1672, he produced *The Great and New Art of Weighing Vanity*, etc., which bore to be the work of M. Patrick Mathers, Archbedal to the Univ. of St. Andrews, the object of which was to expose the ignorance of a Prof. Sinclair of Glasgow, who had put a slight on one of the St. Andrews professors. In 1674, G. (who had married Mary, daughter of George Jamieson, painter), was called to Edinburgh to the mathematical chair, which he filled for little more than a year. In 1675, Oct., when showing the satellites of Jupiter to some of his pupils, he was struck with total blindness, and a few days afterward died at the age of 36. For a particular list and account of his works and discoveries, see Hutton's *Philosophical and Mathematical Dictionary*.

He had a son, JAMES G., M.D. (b. 1674), who became prof. of medicine in King's College, Aberdeen, where he founded the School of Medicine.—This James G., had two sons, JAMES G., M.D. (the second), who succeeded his father in the Aberdeen professorship; and JOHN G., M.D. (q.v.)

GREGORY, JOHN, M.D.: 1724–1773, Feb. 9; b. Aberdeen. He received his early education there, and studied medicine at Edinburgh, Leyden, and Paris. After filling

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in succession the chairs of philosophy and medicine at Aberdeen, he was appointed 1766, professor of the practice of medicine in Edinburgh, where he long held high repute as a teacher and practicing physician, with the greatest personal popularity. He was the intimate friend of the most eminent men of Edinburgh in its most brilliant period. Among his works are—*Elements of the Practice of Physic*, 1772; *A Comparative View of the State and Faculties of Man with those of the Animal World*, 1765; and *A Father's Legacy to his Daughters* (published after his death), 1793. In 1788 his works were collected in 4 vols. 12mo, by Mr. Tytler (Lord Woodhouselee), who prefaced them by life of the author. A life of him also was written by Mr. Smellie.—His son, JAMES G., M.D. (the third), became distinguished as prof. of the practice of medicine at Edinburgh, and a leading man in his profession; the author of *Philosophical and Literary Essays*, 2 vols. 8vo, Edin. 1792.

The son of this Dr. James G. was WILLIAM G. (1803–58); prof. of chemistry in King's College, Aberdeen, and later in the Univ. of Edinburgh. William G. was well known by his contributions to chemical science, and his edition of the inorganic part of Turner's *Elements of Chemistry*; the organic part of which was edited by Liebig. He also translated, 1855, Leibig's *Principles of Agricultural Chemistry*. He was one of the earliest advocates of Liebig's principles in Britain.—Another son of James G., M.D. (the third) was DUNCAN FARQUHARSON G. (1813–44), brother of William G. He was a fellow of Trinity College, Cambridge, and prof. of chemistry; latterly applying himself to mathematics, with important results; author of *Examples in Differential and Integral Calculus*. His *Mathematical Writings* ed. by W. Walton, appeared 1865.

GREGORY OF NYSSA, *nīs'sa* (SAINT): Greek Church-father: abt. 331–396 or 400; b. prob. at Neocæsarea; younger brother of Basil the Great. He early applied himself to sciences and philosophy, and subsequently married a pious and honorable lady. In consequence of a dream, however, he separated from her, and abjuring the world, entered on the duties of an ecclesiastic. After a short relapse into his old profane studies, he renounced this 'apostacy' forever, and 372 was made bp. of Nyssa, city in Capadocia, in Lesser Armenia, to the dismay of the Arians, who knew him to be a zealous defender of the Nicene creed. They at once commenced an opposition to him. G. was deposed by the emperor, and compelled to flee. He lived for some years in seclusion, until, at the death of Valens (378), Gratianus restored him to his see. In 379, he was charged by the council of Antioch to visit the churches in Arabia and Palestine, in order to restore them to their pristine orthodoxy and peace, many years of heresy and dissension having made sad confusion among the flock of the faithful. In 381 he was chosen by the council of Constantinople to be one of the 'Centres' of faith for the Catholic communion, i.e., an arbiter of orthodoxy for his and other congregations, principally in Pontus. He further assisted at the councils in that city 382 and 3, and was

so prominent in both, that shortly afterwards the honorable title of Metropolitan was unanimously conferred upon him. The last public appearances of G. seem to have been at the council at Constantinople 394, and at the consecration of a new church at Chalcedon. The second Nicæan council conferred on him the pre-eminent title of 'Pater Patrum.'

His writings are extremely numerous. Although not fraught with the glowing eloquence and penetrating acumen of Gregory Nazianzen, or St. Basil, they show greater depth of poetical feeling and philosophical thought, while they abound in practical teachings and wise councils. The frequent fanciful, often puerile subtleties and conceits are to be put to the account of his times, when symbolism and allegory reigned supreme. G. was one of the first who manfully stood out for the ancient Greek—albeit heathen—philosophy. His writings are indeed fully imbued with Platonism and Aristotelianism, and he went so far as to borrow the technical terms of these masters for his theological investigations. 'As the Israelites borrowed from the Egyptians,' he said, 'so Christianity must carry with it all that is costly out of the pagan camp;' a saying which, however, has been attributed to some other fathers of the early church. His orthodoxy has been questioned in later times; chiefly for his strongly condemning as heathenish the view that religion was dependent mostly on the dogma: according to him, religion was more a matter of the heart and of feeling. His expectation of a universal restoration of men to holiness also has caused denial of his orthodoxy. The council of Ephesus solemnly and most energetically declared for the soundness of his teaching, refuting the heretics out of his own writings. For his Christology—in the main that of Origen—viz., that the Logos (q.v.) had penetrated all parts of the human nature, and thus elevated it to himself, see ORIGEN. The Latins celebrate the day of G. Jan. 10, the Greeks Mar. 9. His most celebrated works are a catechetical treatise; a dialogue of the Soul and Resurrection, called *Macrina*, after his sister (supposed to have been held at her death-bed); a treatise on *the Holy Trinity and the Deity of the Holy Ghost*, besides a number of homilies. The first complete Latin edition of his writings, comprising dissertations on the Old and New Testament, dogmatical and controversial treatises, discourses, sermons, panegyrics, biographies, letters, etc., appeared at Cologne 1537 (folio), and was followed by others at Basel (1562, 71), and Paris (1573, 1603). The first Greek and Latin editions by the Jesuit Gretier appeared Paris (1615–18), 2 vols., fol., reprinted there 1638. Separate works of G. have been edited repeatedly, but scarcely any have appeared in any modern translation.

GREGORY OF TOURS, -tór, SAINT (originally called GEORGIUS FLORENTINUS): historian of the Franks: b. between 539 and 543, d. 594, Nov. 17; b. at Clermont, Auvergne, of a family exalted by rank as well as by piety; youngest son of Florentius, a provincial senator. On the paternal side, he traced his descent from Vellius Epaga-

tus, martyr of Lyon; on the maternal, from St. Gregory, Bp. of Langres. St. Gallus, Bp. of Clermont, G.'s uncle, undertook his early education, and, after his death, G. continued his studies under St. Avitus, successor of Gallus in the bishopric. Ordained deacon, G. left Auvergne, and went to the court of Siegbert, King of Austrasia. Still very young, he was elected to the see of Tours, and consecrated by Giles, Abp. of Rheims. The first years of his episcopacy were a season of great perplexity, owing to the constant contentions of the first Merovingian kings. His courage was equal to the test, and by openly resisting even royal authority on some occasions, he drew the hatred of Queen Fredegunda, and of her husband, King Chilperich, who seems then to have been a tool in her hands. G. was accused of seditious and treasonable actions, and summoned before a council of bishops 580. He defended himself with such clearness and vigor, that Chilperich himself from that moment became his admirer and friend, and charged him afterward with many important political missions. This royal partiality, however, does not seem to have prevented G. from occasionally calling the king a Herod and a Nero. No less favored by the king's successors, Gontram and Childebert II., G. did not fail to use all his influence with the court for the amelioration of the position of the church, and in behalf of his flock. His travels had, apart from their political purposes, at the same time the object of everywhere restoring peace and piety, so much needed in those days in convents and churches, among the clergy and the laity. His journey to Rome 590, so minutely described, is by recent investigations shown not to have taken place (see Dr. Kries, *De Greg. Tur. Vite et Scriptis*, p. 16). His last journey seems to have been to Orleans, whither he accompanied the king 593. He died shortly afterward at Tours, where he had been a bishop 23 years. He was canonized, and his day in the calendar is Nov. 17. His works comprise ten books of Frankish history, *Gesta, Chronicon Francorum*—first attempt at French historiography—crude in style and without discrimination in materials; *A Book of the Glory of the Martyrs; Of the Miracles of St. Julian* (304); *Of the Glory or Miracles of the Confessors; Of the Miracles of St. Martin*; and a book of the lives of the fathers, consisting of 23 biographies of Frankish ecclesiastics; also many minor writings. Much more, however, is generally attributed to G. than is really his. The first critical edition of his works, by Ruinard, appeared Paris, 1699, fol.; another by Guadet and Taranne, 1837, with French translation; and the well-known edition by the Abbé Migne (1871) in his great collection of the Greek and Latin Fathers. See Lobell, *Gregor von Tours und seine Zeit* (Lpz. 1829; 2d ed. 1869).

GREGORY THE ILLUMINATOR (SAINT), or GREGORY OF ARMENIA: patriarch of Armenia, patron saint of the Armenian Church: b. abt. 257. As with the majority of the bishops of the primitive church, little is known of his early history. He is said to have been educated at Cæsarea, in Cappadocia, where he was instructed in the Christian

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religion. He entered into the service of Tiridates, King of Armenia, by whom he was subjected to severe persecution for his refusal to worship idols. There is an amazing account of his 12 trials by torture, any one of which would have been certain death to any ordinary mortal. Some severe public calamity which succeeded, being viewed as a proof of divine wrath, the king immediately put himself and his subjects under G.'s instructions. The people were converted in great numbers, and churches were soon built throughout the country; and G., after receiving ordination at Cæsarea, returned as metropolitan of Armenia, 302, and baptized his converts. He died within a few years after 331, in which year he had withdrawn alone to a cave in the mountains. Many authors have given in their works discourses professedly by G., now deemed spurious. The memory of G. is held in great reverence in the Greek Coptic, Abyssinian, and Armenian churches, and he is one of the saints of the Roman Calendar.

GREGORY NAZIANZEN, *grèg'o-rî năz-î-ăn'zen*, SAINT (surnamed THEOLOGUS, the Theologian): one of the four great fathers of the Eastern Church: 329-389 or 390; b. Arianzum, village near Nazianzus, in Cappadocia, not far from Cæsarea. His father, whose name also was Gregory, and who had originally belonged to the heathen sect of Hypsistatics, i.e., Worshipers of the Most High, but also of the fire, like the Persians, and keepers of the Jewish Sabbath and of the law concerning purity of meats, had, chiefly at the instigation of his pious wife Nonna, become a convert to Christianity about the time of the great Nicæan Council (325), and four years later was made bp. of Nazianzus. Formed to piety by domestic example, G. was early sent to finish his education in Cæsarea, Palestine, where the study of eloquence flourished. He afterward visited the schools of Alexandria, and then of Athens, where he met Basil the Great, then also a young student, and became his intimate friend. At the same time there studied at Athens, Julian, later the Roman emperor and 'apostate;' and there is no doubt that the three often met and had friendly discussions on their common studies; though G., even at that time, augured no good for Julian, who showed signs of an 'unsettled and arrogant mind.' G. having made brilliant progress in eloquence, philosophy, and sacred literature, returned to Nazianzus, and received baptism at the hands of his own father, consecrating to God, at the same time, all 'his goods, his glory, his health, his tongue, and his talents;' and in order to be still more able to pursue a life of austere devotion, he retired into solitude, and took up his abode with Basil in the desert near the river Iris, in Pontus. Recalled by his father, G. was ordained priest, and afterward fled; and being recalled a second time, he returned to Nazianzus, assisted his father in the ministry, and preached to the people. In 371 or 2, St. Basil, who in the meantime had become bp. of Cæsarea; prevailed on him to accept the see of Sasime, a small town in Cappadocia. But he had scarcely entered on his new duty, when, overcome again by his innate repugnance to public life, he retired, a bishop

without a bishopric, to Nazianzus, where he stayed until the death of his father, 313. He then went into a monastery at Seleucia, which, after the death of Emperor Valens (378), he was induced to leave, in order to undertake the charge of a small Nicæan congregation in Constantinople, where, until then, Arianism had held undisputed sway. G. was after a short time, when his erudition and eloquence became conspicuous, elected archbishop, upon which the Arians became so exasperated that his very life was in danger. He had wonderfully advanced the orthodox cause in the capital, and had built up a great and powerful church by his eloquence and zeal. His five discourses on the Trinity are famous; yet he was not chiefly a theological disputant, and not at all a heresy-hunter, but magnified rather the spirit of Christian love. G., though upheld by Pope Damasus and Emperor Theodosius, preferred resigning his see voluntarily, 'in order to lay the storm, like another Jonah, though he had not excited it.' He went back to Nazianzus, and took up his solitary abode near Arianus, where, after years of a most ascetic life, he died. His ashes were conveyed to Constantinople, and thence, during the crusades, to Rome. His day is, with the Latins, May 9; with the Greek Church, Jan. 25 and 30. His character and temper, ardent and enthusiastic, but at the same time dreamy and melancholy, hard, but also tender, ambitious and yet humble; all his instability and vacillation between a life of contemplation and of action, are vividly depicted in his writings, which mostly serve one great aim of his life in Constantinople—to uphold the integrity of the Nicæan orthodoxy against the heresies of the Arians and Apollinarists. The merits of his writings—which vividly portray the instability and vacillation of his life—are very unequal; sometimes not inferior to the sublimest flights of poetical genius, and withal of a classical elegance and refinement, they at other times become redundant, pedantic, and heavy with far-fetched similes. On the whole, G. may fairly be pronounced one of the first orators, and most accomplished and thoughtful writers of all times. His surviving works consist chiefly of about 53 orations, 242 letters, and 156 poems—meditations, descriptions, acrostics, epigrams, etc.—to which Tollius (Utrecht 1696) added 20, which he called *Carmina Cygnea*. Muratori published (Padua 1709) 228 other unedited epigrams. The first edition of his complete works appeared at Basel, 1550, folio. Another edition appeared Paris, 1609–11 (2 vols. folio), by Morel; reprinted Paris, 1630; Leipsic (rather Cologne), 1690, and Venice, 1753; but none of these is sufficiently accurate. The last edition, but little improved, under the auspices of the Benedictines, appeared in 2 vols. (Paris 1760–1840). His separate works have frequently been edited, and partly translated into different tongues.

GREGORY THAUMATURGUS, *thaw-ma-tēr' gūs* (Wonder-worker), SAINT (originally called Theodorus): b. at Neocæsarea, in Pontus, between 210 and 215; d. prob. in the reign of Aurelian, abt. 270. Sprung from an illustrious and wealthy heathen family, he was educated for a

GREGORY THAUMATURGUS.

rhetorician or advocate; but an acquaintance which he formed with Origen at Cæsarea, in Palestine, allured him to sacred science, and he applied himself under his new master, with zeal and fervor to the study of the Holy Scriptures and of profane philosophy. Several years had thus passed, when Maximin's persecutions forced Origen to leave Cæsarea. G. then went to Alexandria (235-238). Gordian having succeeded Maximin, Origen returned to Cæsarea, and G. went to join him there, and to renew his former studies. Probably it was at that period that he was baptized, and changed his heathen name of Theodorus. Recalled to his family. G., instead of striving for those posts of honor for which he had been intended, retired into solitude; but was so often besought to return and labor for the church, that he allowed himself to be consecrated, about 240, as bishop at Neocæsarea, a wealthy and populous, but utterly unchristian city, G. labored with the utmost zeal. He wrought, according to Gregory of Nyssa and Basil the great, many startling miracles; and thus contrived to change the unbelieving population of his see into devout Christians. It is certain that he had wonderful success in his 30 years episcopate, converting almost the whole city; but nothing related by the writers above named of his miracles approaches the amazing narratives of them in the *Martyrologus*, or even in the *Breviarium Romanum*.

During the persecution of Decius, which broke out 250, G. fled with a great part of his flock, whom he would not see exposed to the danger of having either to change their faith, or to die the death of martyrs; and during this flight (it is narrated) he, when once hard pressed by his pursuers, transformed himself and his deacon—a heathen priest whom he had converted—into trees. In 251, Emperor Decius died, and G. returned to Neocæsarea, and instituted a general festival for those Christians who had fallen during the persecution, and permitted the faithful to celebrate it with banquets and sports like those which accompanied heathen festivals—a proceeding by which he sought to draw over the pagan multitude to Christianity, but which has been severely blamed, and which, indeed, was fraught with great mischief for the church in later times. In 264, he was with his brother Anthenorodorus, at the Council of Antioch, which had been convoked to condemn the heresies of Paul, Bp. of Samosata; the signatures of the two brothers occur first in the Acts of the Council, Whether or not G. took part in the second council (269), necessitated by Paul's refusal to abdicate, is uncertain. Of his own extraordinary piety, devotion, truthfulness, and modesty, of his 'prophetic and apostolic temper,' the best testimony lies in the fact that St. Basil, St. Maximus, and other great luminaries of the church, call him a second Moses or Paul,

The only genuine works of G. are a panegyric on Origen, which he delivered in public before his return to his native place; the above mentioned creed; a Metaphrasis on Ecclesiastes (often wrongly attributed to Gregory Nazianzen) in 12 chapters; and a Canonical Epis-

GREIFENBERG—GRELLET.

He, setting forth the punishments and penances to be undergone by such Christians as had bought booty from pagan soldiers, a practice common in those times of constant invasions of Goths and Scythians in Asia, principally in Pontus. All other writings shown under his name are spurious. The first collected edition of his works was published by Ger. Vossius, Mayence 1604; more complete editions appeared in Paris 1622, 1788.

GREIFENBERG, *grī'fēn-bērĕh*: small manufacturing town of Prussia, province of Pomerania, on the left bank of the Rega 40 m. n.e. of Stettin. It is a decayed place. Pop. about 6,000.

GREIFENHAGEN, *grī'fēn-hā gēn*: town of Prussia, province of Pomerania, on the right bank of the Reglitz, 13 m. s.s.w. of Stettin. The town has two churches, and is the seat of considerable industry.

GREIFSWALD, *grīfs'vāld*: town of Prussia, province of Pomerania, on the Ryck, about 3 m. from its mouth, 20 m. s.e. of Stralsund. It is regularly built, and is surrounded by promenades into which the former ramparts have been converted. The university (founded 1456) is attended by about 650 students. The academy of political economy and agriculture, formerly at Eldena below G., was in 1876, incorporated with the university. The univ. library contains about 135,000 volumes. Weaving, machine-making herring-curing, and manufactures of paper, tobacco, soap leather, and oil are carried on. G. possesses some 60 ships, engaged mostly in the grain trade.—G. was founded in the 13th c., before the close of which it made one in a union of Wendish Hansetowns, comprising Stralsund, Rostock, Weimar, and Lübeck. At the peace of Westphalia (1648), the town came into the possession of Sweden; but, together with the whole of Swedish Pomerania, it was conceded to Prussia 1815. Pop. (1880) 19,924; (1890) 21,633.

GREISEN, n. *grī'zēn* [Ger., to grasp, to lay hold of, to seize]: in *petrol.* and *geol.*, granular, crystalline rock, consisting of quartz and mica, the former predominating, the latter usually of the variety containing lithia. If orthoclase be added, the rock becomes granite.

GREIZ, *grītz*: town of central Germany, cap. of the principality of Reuss-Greiz, and seat of the sovereign prince; charmingly situated on the right bank of the White Elster, 49 m. s.s.w. of Leipzig. It is well built, surrounded by walls, and contains three castles, one for winter, another for summer occupation, with beautiful gardens and park; the third, on an isolated rock, is used for public offices. The town-house, a handsome specimen of Gothic was built 1841. Many of the inhabitants are employed in the manufacture of woolen and half-woolen goods; wool-spinning and dyeing also are carried on. Pop. (1880) 15,061; (1885) 17,288; (1900) 22,346.

GRELLET, *grēl lēt'*, STEPHEN: 1773, Nov. 2—1855, Nov. 16; b. Limoges, France: missionary. He was of noble descent, reared a Rom. Cath., and educated at the milit. college at Lyons. In 1790 he entered the body-guard

GREMIAL—GRENADE.

of Louis XVI., and during the Revolution the family estates were confiscated and he and his brothers made prisoners of war and condemned to be shot. He escaped to Demerara after the execution of the king, came to the United States 1795, and joining the Soc. of Friends, spent several years in mercantile business, and engaged in missionary work 1800. He travelled extensively through the southern and New England states and Canada 1800-7, France 1807, England and Germany 1812, Hayti 1816, Norway, Sweden, Russia, Greece, and Italy 1818-20, the United States 1820-31, and Europe 1831-34, everywhere preaching to large audiences, and at one time before Pope Pius VII. He died in Burlington, N. J.

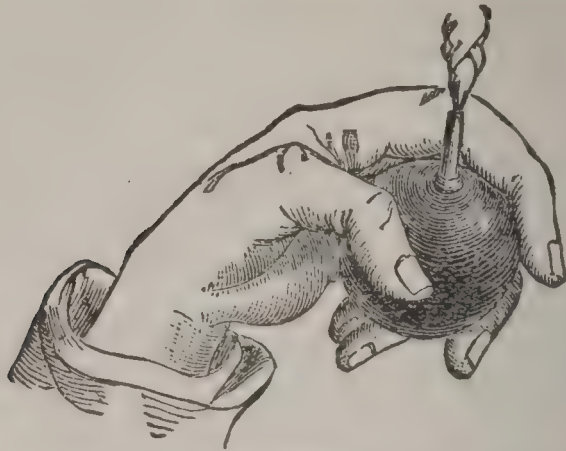
GREMIAL, n. *grĕ'mĭ-al* [L. *gremium*, the bosom]: in *eccles.*, ornament for the breast, lap, and shoulders of a bishop; originally a towel of fine linen, used in ordination to protect the sacred vestments from drops of unction in the act of anointing candidates for the priesthood; in later times of silk or damask to match the episcopal vestments.

GRENADE, *grĕn-ă'da*: island of volcanic origin in the British W. Indies, most southern and said to be the most beautiful of the Caribbees: area 133 sq. m.; abt. 60 m. from the nearest point of S. America. Considerable importations of coolies have taken place. On the coast are several good harbors. A central ridge of mountains, here and there presenting an elevation of 3,000 ft., shows various extinct craters, some transformed into considerable lakes. There are hot springs in G.; earthquakes are sometimes felt, and the average temperature is 82° F. The chief towns are St. George, St. Mark, St. Patrick, St. Andrew, and Charlotte-Town. St. George is the cap., pop. about 5,000. G. formerly had a house of assembly, but is now a crown colony under the general govt. of the Windward Islands. Public revenue amounted (1901) £70,075. Imports and exports were respectively represented by £246,567 and £303,934; the corresponding results in 1833, virtually the last year of unmitigated slavery, having been £73,846 and £288,683. Among the exports are sugar, rum, and cocoa; the last of which seems likely to become the staple. Cotton and tobacco are not now cultivated.—The island was discovered by Columbus on his third voyage 1498, at which time it was inhabited by Caribs, who were subsequently exterminated by the French, into whose hands G. came about the middle of the 17th c. It finally fell into the possession of the British 1783. Pop. 1881 (inclusive of the Grenadines), 42,403; (1901) 64,288.

GRENADE, n. *grĕ-năd'* [F. *grenade*, a pomegranate, a ball of wild-fire made like a pomegranate—from Prov. *granada*—from L. *granatum*, a pomegranate]: a hollow ball of iron or annealed glass, abt. 3 inches in diameter, filled with powder, and thrown from the hand. The discharge is effected by means of a small time-fuze. Hurling among dense masses of troops, as those assembled in the ditch of a fortress during an assault, grenades are particularly embarrassing. the splinters inflicting deep wounds

GRENADILLO—GRENOBLE.

and causing great confusion. Grenades are occasionally rolled over the parapet, through wooden troughs, into the trench below: there is also a species of hand-gun fired from



Grenade.

a rest, called 'musketon,' from which grenades may be projected to a short distance. These missiles are said to have been used first in 1594. **GRENADIER**, *n.* *grĕn'ă dĕr'* [F]: originally a soldier employed in throwing hand-grenades; but in modern parlance a member of the first company of every battalion of foot, in which the tallest and finest men of the regiment are placed. This company used to be distinguished from the rest by tall bearskin caps; it holds the place of honor, viz., the right, when in line, and the front when in column of attack. Now usually applied in Britain to the grenadier guards. **GRENADIER GUARDS**, the first regiment of foot guards in the British household brigade of guards, generally considered the finest corps in the army. It comprises 2,540 officers and men, in three battalions. The officers of this fashionable corps are usually from the families of the nobility or more distinguished landed gentry. The first foot guards, under which name the regiment was originally known, was raised first in 1660; since then it has ever borne an honorable position in all the wars of the country, especially in the Peninsula, at Waterloo, and in the Crimea.

GRENADILLO, *n.* *grĕn-a-dĭl'ō*: in *bot.*, cabinet wood from the W. Indies; called also Grenada cocos, and red ebony. It resembles the common cocoa.

GRENADINE, *n.* *grĕn'ă-dĕn*: a thin strong stuff for ladies' dresses, shawls, etc., similar to barège, made of wool, but now to a considerable extent made of silk.

GRENADINES, *grĕn-a-dĕnz'*: chain of islets in the W. Indies, between Grenada (*q.v.*), on which they are chiefly dependent, and St. Vincent; lat. 12° 30'—13° n. They vary in size, the largest, Carriacou (pop. 3,071), being abt. 7,000 acres. Much inconvenience is caused by their deficiency in streams and springs, an evil which, of late years, has been increasingly felt, from the injudicious destruction of the timber.

GRENELLE, *grĕh-nĕl'*: suburb of Paris (*q.v.*).

GRENOBLE, *grĕh-nō'bl* (corruption of the Lat. *Gratiano-*

GRENVILLE.

polis, or city of Gratian): important town and strong fortress of France, with double inclosures, cap. of the dept. of Isère, pleasantly situated on both banks of the river of that name, in a beautiful and fertile district, surrounded by high mountains, about 58 m. s.e. of Lyon. It is divided by the Isère, is here confined within handsome quays, into two unequal portions: one, narrow, consisting of only two streets, on the right bank of the river at the foot of a hill, is called St. Laurent; the other, much more important, containing all the public buildings, and consisting of spacious and well-lighted streets, on the left bank, is called Bonne. Among the public buildings are the Palais de Justice, with a Gothic oriel, originally the palace of the Dauphin, and the most interesting old building in the town; the Académie Universitaire; the town-hall; the public library, containing 100,000 vols. and 1,500 mss.; and the picture-gallery. G. has gained repute for its manufactures of gloves (in making which more than 20,000 persons are employed at more than 100 factories), leather goods, watches, liqueurs, perfumes, chemicals, and silk. There is besides a brisk trade in hemp, iron, wood, and cheese. —G., originally a city of the Allobroges, was fortified by the Romans. It was Burgundian in the 5th century, and later belonged to Dauphiné. Pop. (1901) 68,615.

GRENVILLE, *grën'vîl*, GEORGE: English statesman, reputed author of the Stamp Act, which first drove the American colonies into resistance: 1712, Oct. 14—1770, Nov. 13; brother of Richard G., Lord Temple, and brother-in-law of the Earl of Chatham. He entered parliament 1741, and 1744–62, filled several minor govt. offices. In 1757 he introduced a bill for the regulation of the payment of the navy. In 1762 he became sec. of state, and then first lord of the admiralty; and in the following year he succeeded Lord Bute as prime minister, uniting in himself the offices of chancellor of the exchequer and first lord of the treasury. He resigned the premiership 1765, and died 1770. G. was exemplary in private life, and distinguished for public spirit, business qualities, and knowledge of parliamentary forms; but he was of narrow political vision, and utterly lacking in tact; and his imperious nature made him unpopular, alike with the king, the parliament, and the people.

GREN'VILLE (or GREEN'VILLE, or GRAN'VILLE), Sir RICHARD: 1540–91; b. England: admiral. He was a cousin of Sir Walter Raleigh, entered the German army and fought against the Turks 1556, received a milit. appointment in Ireland where he became sheriff of Cork, was elected member of parliament 1571 and knighted by Queen Elizabeth. Co-operating with Sir Walter Raleigh in his attempts to plant colonies in America, he commanded the fleet of 7 vessels which landed 108 colonists at Wocoken, N. C., 1585, June 26. In 1588 he was appointed a member of the council to devise means of defense against the Spanish Armada (see ARMADA), and for his services during that great naval movement was made vice-admiral

GRENVILLE—GRESHAM.

1591, and the same year off the Azores, with only 5 ships, fought a Spanish fleet of 53 vessels, beat them off 15 times, sank 4, and after being fatally wounded was forced to surrender. All English historians have greatly extolled his skill and courage on this occasion, but none have given the month nor day of the battle.

GRENVILLE, WILLIAM WYNDHAM, Lord: 1759, Oct. 25—1834, Jan. 12.; third son of George G. After studying at Eton and Oxford with brilliant success, he became a member of the house of commons 1782, and attended his eldest brother, lord lieut. of Ireland, as secretary. Soon afterward, he became paymaster-gen. of the army, and 1789 was chosen speaker of the house of commons. In 1790 he was appointed sec. of state for the home dept. and was raised to the peerage with the title Baron Grenville. He became foreign sec. 1791. He resigned office, with Pitt, 1801, on the refusal of George III. to give his assent to the Rom. Catholic Emancipation Bill. He was premier 1806-7. In 1809 he was chosen chancellor of the Univ. of Oxford. 1809-15 he acted with Earl Grey, and he generally supported Canning. Lord G. was an able speaker, with much influence among the peers, and an excellent scholar.

GRESHAM, *grësh'am*, Sir THOMAS: founder of the London Royal Exchange: 1519-1579, Nov. 21; second son of Richard G., an opulent merchant who was elected 1537 lord mayor of London; descended from an ancient Norfolk family. He was apprenticed to his uncle, Sir John G., a wealthy London mercer, and then sent to study at Gonville Hall, now Caius College, Cambridge. In 1543, he was admitted a member of the Mercers' Company. In 1552, G. was sent to Antwerp, as king's factor there, in consequence of the mismanagement of the person previously in charge. In two years he paid off a heavy loan, entirely restored the king's credit, and introduced a new system of finance. The principal duty of the royal agent, negotiation of foreign loans, was discharged by G. with great fidelity and success. As he was a Protestant, Queen Mary, on her accession, sent him his dismissal; but on presenting a memorial of his past services, he was soon reinstated. By Queen Elizabeth, 1559, he was knighted, and appointed, for a short time, English ambassador at the court of the king of Spain's regent at Brussels. The troubles in the Netherlands compelled him, to withdraw finally from Antwerp, to which city he had made more than forty journeys on the service of the state, in one of which, 1560, he was thrown from his horse, and rendered lame for life. In 1569 by his advice, the plan of borrowing money from the London merchants, instead of from foreigners, was adopted, to the great advantage of the mercantile body. Having lost his only son, Richard G., 1564, he resolved upon devoting a portion of his great wealth to the erection of a bourse or exchange, in imitation of the one at Antwerp, for the London merchants, who were wont to meet in the open air—a project which originated with his father. It was formally opened,

GRESHAM—GRETN A GREEN MARRIAGES.

1570, by Queen Elizabeth in person, on which occasion she dined with the founder, and named it the Royal Exchange. Renowned for his hospitality and liberality, he frequently entertained foreign personages of distinction, and erected a magnificent mansion at Osterly Park, near Brentford, where he was visited by Queen Elizabeth. For the endowment of a college in London, he directed by his will that his town-mansion in Bishopsgate street should be converted into a residence and lecture-rooms for seven professors, to be salaried out of the Royal Exchange revenues. Gresham College was taken down 1768, and the ground on which it stood was transferred to government. The lectures were delivered in a room in the Exchange till 1843, when the lecture-hall at the corner of Gresham street was built out of the accumulated fund. The subjects of lecture are divinity, physic, astronomy, geometry, law, rhetoric, and music. G. also provided for the erection and support of eight alms-houses, and made many other charitable bequests.

GRESHAM, *grěsh'am*, WALTER QUINTON: lawyer: 1832, Mar. 17—1895, May 28; b. Corydon, Ind. He received a univ. education, but was not graduated; was admitted to the bar 1853; elected to legislature 1861; resigned to become lieut.col. 38th Ind. vols., and was afterward col. 53d Ind. vols.; was promoted brig.gen. of vols. for services at Vicksburg 1863, and was brevetted maj.gen. of vols. 1865 for gallantry before Atlanta. He resumed law-practice in New Albany, Ind.; was appointed U. S. judge for the dist. of Ind. 1869; became postmaster-gen. in Pres. Arthur's cabinet 1882, sec. of the treas. 1884, and U. S. judge of the 7th judicial circuit 1884. In 1892 he declined nomination as presidential candidate of the People's party, giving his support to the democratic principles as represented by Mr. Cleveland, and on the accession of the latter to the presidency 1893, G. was appointed sec. of state. He was noted for independence of character and for strong will.

GRESSORIAL, a. *grěs-sō'ri-ăl* [L. *gressus*, a stepping or step]: applied to the feet of birds which have three toes forward, two of them connected, and one behind.

GRETN A GREEN, *grět-nă-grěn*: name originally of a farmstead in the vicinity of the village of Springfield, parish of Graitney, Dumfriesshire, Scotland, but frequently applied to the village of Springfield itself, about a mile and a half n. of the n.e. extremity of the Solway Firth. The village was long the centre of extensive smuggling operations, and more recently it became famous (or infamous) for its irregular marriages.

GRETNA GREEN MAR'RIAGES: the name given to marriages of English persons in Scotland, contracted mostly at Gretna Green (q.v.), the first convenient halting-place for runaway couples from England. This kind of marriage was originally an easy mode of evading the English Marriage Act, which required the consent of parents and guardians, publication of banns, and the presence of a

GRÉTRY—GREUZE.

priest—all involving considerable publicity and delay. The rule being, that a marriage is valid if contracted according to the law of the place where the parties enter into the contract, it was easy for English couples to avail themselves of the law of Scotland, which required nothing but a mutual declaration of marriage to be exchanged in presence of witnesses, and did not prohibit the marriage of minors. This declaration generally took place in presence of a blacksmith, who really was no more necessary than any other witness, but who gradually assumed a sort of authority. The parties could return at once to England and their marriage was ever after held valid there and all the world over. These marriages have been much checked of late. Not only has the strictness of the English law been relaxed by allowing marriages to be contracted in England in comparative secrecy before the superintendent registrar, without going before a priest, but also the Scotch law has been altered. No irregular marriage of that kind in Scotland is now valid unless one of the parties had at the date thereof his or her usual place of residence there, or had lived in Scotland 21 days next preceding.

GRÉTRY, *grā-tre'*, ANDRÉ ERNEST MODISTE: 1741, Feb. 8,—1813, Sep. 24; b. Liège, Belgium: musical composer. He entered the choir of the cathedral at Liège when 6 years old, received instruction from local musicians, composed a mass and dedicated it to the canons of the cathedral 1759, and was sent by them to study in the Collège de Liège at Rome. He studied there 5 years, completed his musical education with Casali, and achieved, his first success as a composer by the operetta *Le Vendémiatrici*, produced at the Aliberti Theatre in Rome. Early in 1767 he went to Paris, and thenceforth applied himself to French comic opera, composing *Le Huron* 1768, then *Lacile* and *Le Tableau Parlant*, *Zémire et Azor* 1771, *Richard Cœur de Lion* 1784, *Barbe-Bleue*, *Guillaume Tell*, *La Rosière Républicaine*, *La Fête de la Raison*, and nearly 50 other operas, serious and comic. He is esteemed one of the founders of French comic opera.

GREUZE, *grüz*, JEAN BAPTISTE: 1725, Aug. 21—1805, Mar. 4; b. Tournus near Macon: French genre painter. He studied painting at Lyons and Paris, attracted notice by his earliest pictures, *A Father Explaining the Bible to His Family*, and *The Blind Man Cheated*, and was admitted by the Acad. 1755. He visited Rome, and desiring to rank as a historical painter, chose classical subjects, in which he failed, and ultimately returned to his former style of genre, *The Girl Crying over Her Dead Bird*, *The Good Mother*, *The Bad Boy Punished*, and the like. He died at Paris, in great poverty due to his own improvidence. G. was a fine colorist, but great success was due mainly to his choice of subjects. At the Pourtalis sale 1865, his *La Jeune Fille à l'Agneau*, was sold for 1,000,200 francs, nearly \$200,000. He represented a reaction against the artificiality of the age, and a return to nature, though he himself was still hampered by the 18th c. spirit.

GREVILLE—GREW.

GREVILLE, *grèv'ül*, CHARLES CAVENDISH FULKE: historian: 1794, Apr. 2—1865, Jan. 18; b. London; great grandson of the 5th Earl of Warwick, and grandson of the Duke of Portland. He was a page to George III., was educated at Eton and Christ Church, Oxford, but left before graduation on being appointed private sec. to the Earl of Bathurst, and was appointed sec. of the island of Jamaica with a deputy to perform the work. In 1821 he became clerk of the privy council in ordinary, and held the office till 1860, thus serving under three sovereigns, George IV., William IV., and Victoria. He led the life of a man of fashion, was welcomed into the highest political and social circles, was an early member of the Jockey Club, a patron of the turf, and owner of several of the most noted horses ever bred in England, and was on terms of utmost familiarity with George IV. He was for a time sec. to the board of trade and plantations, and 1845 published a book, *Past and Present Policy of England toward Ireland*, in which he advocated the relief of the Rom. Catholics by the payment of their clergy. His fame chiefly rests on the posthumous publication of a portion of his diary, in which he recorded his impressions on the people, ceremonies, and events of his time. A part of these records covering the period 1820-37 was published under the title *Journal of the Reigns of George IV. and William IV.* (1874), and aroused much interest.

GRÉVY, *grā-vē'*, FRANÇOIS PAUL JULES, Ex-President of the French Republic: b. 1813, Aug. 15, at Vaudrez in the Jura. He studied law, and became an advocate at Paris. He took part in the revolution of 1830, and 1848 was returned to the constituent assembly. There he held an independent position, but was generally ranked with the extreme left. After Louis Napoleon's *coup d'état*, G. withdrew from politics, and applied himself to his professional work. He returned to political life 1868. After the Franco-German war he was appointed pres. of the national assembly; he resigned 1873; and after the general election 1876, he became again pres. of the chamber. When, 1879, Jan., Marshal MacMahon resigned the presidency of the rep. G., who was a thorough but not extreme republican, was by large majority elected his successor. G. had never been a blind partisan, and he had the respect and confidence of all parties, until the strange and unfortunate complication of his name with some scandalous proceedings of his son-in-law, Wilson, who was adjudged guilty of the sale of offices and distinctions for money. No charge of guilty knowledge of these acts was made against G.; but the scandal was so great and so near his person that his resignation of his exalted office was compulsory under the unreasoning popular indignation, 1887, Dec. 3. He died Sep. 9, 1891.

GREW, *gró:* pt. of Grow, which see.

'GREW, *grū*, MARY: reformer: b. Conn., 1813: daughter of the Rev. Henry G. (Bapt). She was educated in Catherine E. Beecher's young ladies' seminary in Hartford, received a special training in metaphysics, and became a skilful logician, popular speaker, forcible writer, and ef-

GREW—GREY.

fective anti-slavery advocate. She removed to Philadelphia 1834, and entered the ministry of the Unit. Church. Her great work, beginning almost in childhood, was in behalf of the colored people, free and slave. She was corresponding sec. of the Philadelphia Anti-slavery Soc. for about 30 years, and during that period prepared annual reports which attracted wide attention. She also was editor for a long time of the *Pennsylvanian Freeman*, the organ of the Philadelphia society.

GREW, GREWSOME: see under **GRUE**.

GREWIA, *grô'v-a* [named from Nehemiah Grew (1628–1711), earliest vegetable anatomist and physiologist of England]: genus of trees of nat. ord. *Tiliaceæ*, having simple and more or less ovate leaves, and a drupaceous fruit. They are African and Asiatic, mostly tropical and subtropical. The bast of some species and the wood of others is valuable; and the leaves of others are given as fodder to cattle.

GREY, a. *grā*: another spelling of **GRAY**, which see. **GREY-BEARD**, a contemptuous name for an old man. **GREY-HEADED**, having the hair of the head intermixed with gray hairs, generally an indication of advancing years. **THE GREY MARE IS THE BETTER HORSE**, the wife rules the husband. **THE GREYS, or SCOTS GREYS**, a British cavalry regiment, so named because mounted on gray horses. **GREYSTONE**, a. grayish granular rock of volcanic origin. **GREY- or GRAY-FRIARS**, Franciscan friars, so named from the color of their habit (see **FRIAR**). **GREY-POWDER**, a combination of chalk and mercury, much used as a medicine. **GREY-WETHERS**, the weather-worn and half-rounded blocks of gray sandstone which are scattered over the surface of the lower Downs and other districts in the s. of Eng.; also known as *Sarsen* or *Druid stone*.

GREY.

GREY, *grā*, CHARLES, Earl, K.G.: British statesman, head of the govt. which carried the Reform Bill: 1764, Mar. 13—1845, July 17; b. Fallodon, near Alnwick; son of the first earl (Gen. Sir Charles G., K.B.), distinguished soldier who held commands in the war against the American colonies, and in the war against the French republic. The Greys are a Northumberland family of great antiquity, celebrated for military achievements, and ennobled in the time of Edward IV. Young G. was sent to Eton, thence to Cambridge, then visited the continent; and in his 22d year entered the house of commons as M.P. for his native county. He became a follower of Fox, and his maiden speech was in opposition to the address of thanks to the king for negotiating the commercial treaty with France. He soon obtained a leading position in the house of commons, and was one of the managers of the impeachment of Warren Hastings. He was also one of the founders of the Society of Friends of the People, afterward suppressed as unworthy in its spirit and dangerous in methods. In 1793, he was selected to present a petition from this society, in which the defects and abuses of the representative system were forcibly exposed. He was outvoted on this occasion, and again 1797; and seems soon to have recognized his effort in furthering the aims of the society, as a mistake due to inexperience. In 1799, he opposed the proposal for the Irish union, but recommended the abolition of 40 rotten boroughs in Ireland as a means of securing the independence of Irish members. When the whig administration of Lord Grenville came into office 1806, G., now Lord Howick, became first lord of the admiralty. Fox died in Sep., and was succeeded by G. as sec. of state for foreign affairs, and leader of the house of commons. The cabinet was broken up 1807, but not before it had carried the abolition of the slave trade, and the enlistment of soldiers for a limited period instead of for life. It was unfortunate, both for G. and the whigs, that he was, by the decease of his father 1807, removed from the house of commons, where he might have led the opposition, to the upper house, where his advocacy of measures of progress and amendment found little response. G. and Lord Grenville, as the leaders of the whig opposition, were more than once urged by the Prince of Wales, after he became regent, to coalesce with the tory ministry, but these overtures were firmly rejected. G. actively opposed the bill of Pains and Penalties against Queen Caroline. During the long period in which he remained in opposition, 1807–30, he gave strenuous support to the abolition of religious tests, removal of Rom. Cath. disabilities, and amelioration of the criminal code. The year 1830 was a period of great political disorder and discontent. The French Revolution had familiarized the bolder and more ardent spirits with the idea of resistance to the government. Nightly conflagrations in the agricultural districts alarmed the timid. Many extreme partisans on both sides were ready for civil war. When parliament met in Nov. G. gave warning of the approaching hurricane, and again urged the adoption of measures of temperate reform. It

was in answer to this speech that the Duke of Wellington made his memorable declaration against reform, and expressed his admiration of the existing system of representation. This was the death-blow to the Duke's government. Being outvoted on a motion of Sir H. Parnell's on the Civil List, the cabinet resigned, and William IV. sent for G., who formed a whig govt., of which he was premier. The whigs set to work in earnest to clear away the gross abuses and nests of corruption which had accumulated during nearly 70 years of toryism; above all, a great, comprehensive, and searching measure of parliamentary reform was prepared by a sub-committee of the cabinet, consisting of Lord J. Russell, Lord Durham, Lord Duncannon, and Sir J. Graham. The bill was brought into the house of commons 1831, Mar. 1, by Lord J. Russell, and electrified the nation. It was, however, fiercely opposed in both houses. General Gascoyne carried a resolution against reducing the number of M.P.'s. G. thereupon advised the king to dissolve parliament. 'The bill, the whole bill, and nothing but the bill,' was the watchword at the elections; and when the new parliament met the bill was carried through the lower house by large majorities. The second reading was moved by G. in the house of lords, 1831, Oct. 3: after five nights, the bill was thrown out by 199 votes against 158. The reply of the house of commons was an immediate vote of confidence in the ministers. The king prorogued parliament, in order that, after the shortest possible interval, the bill might be again introduced. Riots took place at Nottingham, Derby, and Bristol. At Birmingham, 150,000 men threatened to march upon London. The metropolis was in a fever of excitement. A second Reform Bill passed the house of commons, which also passed a second reading in the house of lords, the tories being determined to mutilate it in committee. Lord Lyndhurst moved the postponement of the disfranchising clauses, and the whigs being beaten, G., with Brougham, resorted to the extreme remedy of demanding from the king a new and large creation of peers. The king refused his consent, and G. resigned. The popular excitement increased. The king sent for the Duke of Wellington, but Sir Robert Peel refusing to join the duke in the attempt to form a government, G., again sent for by the king, consented to form a govt. only on condition that enough new peers should be created to ensure the passing of the bill by the lords. The chancellor, Lord Brougham, joined in the demand, to which the king at last reluctantly assented, —putting his assent in writing, on Brougham's shrewd request. From the date of this memorable writing by William, 1832, May 17, the house of peers has been recognized as lacking power to stand against a responsible government by the ministry supported by the commons. G. returned to office, armed with this new power, which, if he had used it by the creation of 60 new peers, would, as has been remarked, 'have been equivalent to the abolition of the house.' The power was not exercised. The mere concession of it sufficed to lead a sufficient number of peers to absent themselves, and the Reform Bill was carried 1832, June

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4, in the house of lords by a majority of 84. Thus G., who had seemed in 1827 the mere relic of the extinct whig party, stood forth in 1832 at the head of that party not only revived but supreme in parliament and with the people. G. took office on the principles of peace, retrenchment, and reform. His govt., however, lost much of its popularity in England by his deference to the hostility of the lords, and his attempt to conciliate his opponents by a division of patronage. In Ireland, Stanley's quarrels with O'Connell and the Irish repealers also tended to weaken the government. Many important measures however, were passed—the measure for national education in Ireland, the Irish Church Temporalities Bill, and the bill for abolishing slavery in the W. Indies. In 1834, Dec., the Grey ministry fell to pieces on the Irish Coercion Act. G. retired from the post of first lord of the treasury with the respect and esteem of the entire nation. A more honorable man never existed. A moral dignity stamped his every action, and over his truthfulness no cloud ever passed. He passed the last ten years of his life in comparative retirement, and died at his family mansion, Howick House. His personal appearance was stately and dignified, his gestures were animated, and his tones lofty and sonorous. He left eight sons and four daughters.

GREY, Sir GEORGE, K.C.B., governor and commander-in-chief of New Zealand: b. 1812, at Lisburn, Ireland. He was educated at the Royal Military College at Sandhurst, attained a captaincy, and started 1837 to explore the interior of Australia, then little known. In 1838, Sep. he organized another expedition to explore the Swan river district. In 1841, he received the unasked position of governor of S. Australia. In 1846, he was made gov. of New Zealand. In 1854, he was appointed gov. and commander-in-chief of the Cape of Good Hope. The task of allaying the asperities and irritation left by the Kafir war he fulfilled with high statesmanship. In 1858, he gave up his post through a disagreement with the colonial office, but was requested by the govt. to resume his governorship. In 1861, he was again appointed gov. of New Zealand; the natives received him with joy, and he succeeded in bringing about pacific relations with the Maories. He resigned, and returned to England 1867. G. is the author of *Journals of Discovery in Australia* (1841); *Polynesian Mythology* (1855); *Proverbial Sayings of the Ancestors of the New Zealand Race* (1858).

GREY, Lady JANE: English woman of royal birth and singular misfortunes: abt. 1537–1554, Feb. 12; b. Broadgate, Leicestershire; eldest daughter of Henry G., Marquis of Dorset, afterward Duke of Suffolk, and Lady Frances Brandon. Lady Frances was daughter of Charles Brandon, Duke of Suffolk, and of Mary, sister of Henry VIII., who had been married to Louis XII. of France, but had become a widow. Lady Jane G. was thus great-granddaughter of Henry VII. Having at an early age showed surprising talents, she was furnished with an excellent tutor, Aylmer, afterward bp. of London, and under

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his care made extraordinary progress in arts and sciences, and particularly in languages, being able to speak and write Latin and Greek, as well as French and Italian. She was the marvel of the age for learning, finding in study a refuge from the harshness and severe discipline of her domestic life in her father's house. We have the testimony of Roger Ascham, that he found her reading the *Phædon* of Plato in Greek, while the rest of the family were engaged in hunting. She also sang and played well, and was versed in other feminine accomplishments.

In 1553, after the fall of Somerset, the Dukes of Suffolk and Northumberland, ruling in the name of the youthful and invalid King Edward VI., and foreseeing his speedy death, determined to change the succession to the crown, and secure it to their own families. Lady Jane G., then 16 years old, was therefore married to Lord Guilford Dudley, fourth son of the Duke of Northumberland, 1553, May. The king, failing in body, and weak in mind, and surrounded by selfish or fanatical advisers, was persuaded to make a deed of settlement, setting aside the right of succession of his sisters Mary and Elizabeth, and Mary Queen of Scots, leaving the crown to Lady Jane, who was innocent of the conspiracy. After the king's death, her ambitious relatives hailed her as 'queen.' Lady Jane at first shrunk from honor so treacherously won, but ultimately yielded to their entreaties and demands, and allowed herself to be proclaimed queen. The people of England resented the unscrupulous conduct of Suffolk and Northumberland; and though Lady Jane was known to be learned, brilliant, and amiable, they rallied with the true English instinct of loyalty round Mary, who had retired to Norfolk, where adherents were gathering to her. Northumberland, who moved thither with an army, was defeated, sent to the tower, and beheaded 1553, Aug. 22; and 1554, Nov., Lady J. and her husband were condemned. For a while, Mary hesitated to pronounce sentence of death against the young couple, but at length she issued the fatal warrant Feb. 8, which was executed in the case of both four days afterward. Lady Jane reigned only ten days. She met her fate with Christian firmness, making a brief address, in which she confessed the justice of her sentence; but said: 'I only consented to the thing I was forced into.' Several epistles and other writings attributed to her are extant.

GREYHOUND, or GRAYHOUND, n. *grā'hownd* [Icel. *grey-hundr*; Fr. *grey*, dog, *hundr*, hound; Scot. *grey*, badger]: kind of dog distinguished by great slenderness of form, length of limbs, elongation of muzzle, swiftness, and power of endurance in running. There are varieties differing in less important characters, but these are common to all. They have also prominent eyes and very keen sight, but their scent is not acute, and they pursue their prey not by the scent, like the hounds (q.v.) properly so called, but by keeping it in view. Some varieties, however, as the *Scottish G.*, probably from being crossed with the staghound or some other of the hounds, combine superior powers of scent with the ordinary qualities of the greyhound. Grey-

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hounds have the parietal bones convergent, not parallel as in the hounds. The face exhibits an almost straight line from between the ears to the nose. The ears are small and sharp, half pendulous in some varieties; quite erect in some others. The chest is deep; the belly much contracted; the paws are small; the hair is long and rough in some varieties, short and smooth in others; the tail is long and slender, curved up at the tip, and in the common smooth-haired



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greyhounds of w. Europe, is covered with hair similar to that of the rest of the body; but there are other varieties with a bushy tail. It is probable that the G. originally belonged to some of the wide plains of central Asia, or n. Africa; it has been very long employed by man as a hunting-dog; it is figured on the monuments of ancient Egypt, and has been common from earliest historic times in India, Persia, and other countries of Asia, also in Greece, and throughout Europe. Probably it was brought to w. Europe from the east; and old records show that high value was set upon it. It was long employed chiefly in the chase of deer; and on one occasion Queen Elizabeth was entertained with the pleasant spectacle of 'sixteen bucks, all having fayre lawe, pulled down with greyhounds,' which she viewed from a turret at Cowdrey Park, Sussex, the seat of Lord Montacute. The right to possess greyhounds was a proof of gentility; and the effigy of this dog often appears at the feet of monumental figures of knights in armor. The killing of a G., in the good old times, was a felony, punished as severely as murder.

The smooth-haired variety of G., used in 'coursing,' (q.v.) was imported from France, and improved by further

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importations from Greece, Italy, n. Africa, and India. The varieties previously in use were rough-haired, and some of them larger and stronger. The *Irish G.*, now almost or quite extinct, was large and powerful, so that while wolves existed in Ireland, it was used to hunt them. The *Italian G.* is a very small and delicate variety, of gentle manners—a drawing-room pet. Greyhounds generally do not show such strong attachment as other dogs to particular persons; and though so long reduced to the service of man, are inferior to many other dogs in the degree of their domestication. The Grecian and Turkish greyhounds have been trained to stop if a stick is thrown among them when in full pursuit of a doubling hare. A whole pack will thus be stopped, and then one, singled out, will pursue the game. The fleetness of the G. is illustrated by an anecdote in Daniel's *Rural Sports*, of a brace of greyhounds in Lincolnshire running after a hare more than four m. in 12 minutes—the increase of distance by turns not being reckoned—when the hare dropped dead.

Various etymologies of the name G. have been proposed one of which refers it to the prevalence of a gray color in the breeds formerly most common: another derivation is from *Graius*, Grecian.—The *gazehound*, mentioned by old writers, is supposed to be the G., the name being probably given when a pure breed, hunting by sight alone, was introduced.

GREYLOCK, *grā'lok*: peak of Saddle Mountain in Adams tp., Berkshire co., Mass., locally known as Saddle Ball; highest point of land in Mass.; 3,500 ft. above sea-level. The sides are covered with forests and the summit commands a view of a large stretch of scenery.

GREYTOWN, *grā'town* (properly **SAN JUAN DEL NORTE**), or **SAN JUAN DE NICARAGUA**: seaport on the Mosquito coast, Nicaragua, Central America, at mouth of the San Juan river; lat. 10° 55' n., long. 83° 43' w. As the chief place in the old Mosquito kingdom, it was occupied by the British 1848, became terminus of the Nicaraguan transit 1853, was bombarded by U. S. war vessels for infringing on the rights of the transit company 1854, and was secured to Nicaragua by treaty with Great Britain after its inhabitants had formed an independent govt. 1860. For several years private and official (naval) American surveying parties have made it the Atlantic terminus of a proposed interoceanic canal. The virtual failure of the French (de Lesseps) Panama canal scheme (1888-9) stimulated American engineers. A bill to incorporate the Maritime Canal Company of Nicaragua passed both houses of congress and was signed by Pres. Cleveland 1889, Feb. 20; and the sec. of the navy granted a year's leave of absence to Commander R. D. Evans, U.S.N., to enable him to superintend the construction. G. has a natural harbor of much value which has been almost destroyed by salt deposit from the San Juan river. The restoration of this harbor was considered (1889) the most difficult part of the canal construction, and the U. S. survey allowed

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\$1,767,000 for that purpose. It was proposed to divert the lower San Juan river into the Colorado branch, isolate the harbor, dredge it, and run a break-water 3,000 ft. from the outer line of the harbor into the Caribbean Sea, with 6 fathoms at its seaward end. The total distance from ocean to ocean is about 180 m., of which 62 m. would be artificial; and U. S. engineers claim that this canal will save 8,000 m. in the water voyage to the Pacific, and could be completed in 6 years. See INTEROCEANIC SHIP-CANAL. Pop. of G. (1885) 1,200; (1890) abt. 1,500.

GREYWACKE: see GRAYWACKE.

GRICE, GRISE, GRIZE: see GREES.—In *her.*, *Grices* are young wild boars.

GRIDDLE: see under GRIDIRON.

GRIDE, *v.* *grīd* [Ger. *gerte*; Dan. *gard*, a rod: Bav. *wart*, a switch]: in *OE.*, to pierce or cut; to cut through; to cut harshly or with a grating sound. GRIDING, *imp.* GRIDED, *pp.*: see GIRD 3.

GRIDIRON, *n.* *grīd'irn* [W. *greidyll*, a griddle—from *greiddio*, to scorch or singe: Ir. *greideal*, a griddle: Gael. *greud*, to burn, to scorch: Sw. *gradda*, to roast]: a grated frame for broiling flesh or fish over a fire; a kind of frame for drawing up a ship on to be docked and repaired. GRIDDLE, *n.* *grīd'l* [Scot. *girdle*]: an iron plate to bake cakes on; a bakestone; a sieve with a wire bottom used by miners.

GRIDLEY, *grīd'li*, RICHARD: 1711, Jan. 3—1796, June 20; b. Boston: soldier. Hereceived a milit. education, was chief of the corps of engineers engaged in the reduction of Louisburg 1745, appointed col. in the British army 1755, planned and constructed the fortifications at Lake George, N. Y. (q.v.), took part in the investment and capture of Quebec, and was rewarded with the gift of Magdalen Island and half-pay for life from the British govt. He became chief engineer and chief of artillery in the colonial army 1775, planned the Bunker Hill fortifications and was wounded in the battle, took part in constructing the fortifications at Boston, and was appointed maj.gen. by congress 1775, Sep. 20.

GRIEF, *n.* *grīf* [F. *grief*, oppression: It. *gravare*, to aggrieve, to oppress—from L. *grāvis*, heavy]: pain of mind on account of any trouble past or present, or of fault committed; sorrow; that which afflicts. GRIEF'LESS, *a.* without grief. GRIEVE, *v.* *grēv* [from *grief*: OF. *greva*, to grieve]: to cause pain of mind to; to afflict; to hurt; to feel pain in mind; to mourn or lament. GRIEV'ING, *imp.* GRIEVED, *pp.* *grēvd*. GRIEV'ER, *n.* one who. GRIEV'ANCE, *n.* *-āns*, that which causes grief or uneasiness; a hardship or wrong. GRIEV'INGLY, *ad.* *-lī*. GRIEV'OUS, *a.* *-ūs*, hard to be borne; burdensome; distressing. GRIEV'OUSLY, *ad.* *-lī*. GRIEV'OUSNESS, *n.*—SYN. of 'grief': affliction; distress; trouble; sadness; trial; grievance;—of 'grievance': hardship; burden; oppression; trouble; injury; affliction; grief;—of 'grieve': to sorrow over; mourn; try; offend; vex.

GRIEFFUL—GRIESBACH.

GRIEFFUL, n. *grēf'fūl* [see **GRIEF**]: in *OE.*, full of sorrow or grief; melancholy.

GRIEG, *grēg*, **EDWARD**: Norwegian composer, b. 1843, June 15, at Bergen. He was educated at Leipzig and Copenhagen, and settled at Christiania. His works include concertos for the piano, violin sonatas, quartettes, pieces for the piano, and songs.

GRIERSON, *grēr'son*, **BENJAMIN HENRY**, U.S.A.; b. Pittsburg, Penn., 1837, July 8. During the civil war he was appointed aide on the staff of Gen. Prentiss; maj. 6th Ill. cav. 1861, Aug.; col. 1862, Mar. 28; commander of a cav. brigade, 1862, Dec.; brig.gen. vols. 1863, June 3; maj.-gen. vols. 1865, May 7; col. 10th U. S. cav. 1866, July 28; and brevetted brig.gen. and maj.gen. U. S. A. 1867, Mar. 2. He was one of the most conspicuous cav. leaders, and conducted many noted raids and expeditions. After the war he commanded the Indian Terr. dist. 1868-73, was engaged in scouting and exploring duty and Indian campaigns 1875-81, and was appointed commander of the dist. of N. Mex. 1886, Nov. 13.

GRIESBACH, *grēs'bach*, **JOHANN JAKOB**: author of the first critical edition of the New Testament; 1745, Jan. 4-1812, Mar. 24; b. Butzbach, in Hesse-Darmstadt. While G. was a child, his father was called to St. Peter's Church, in Frankfurt-on-the-Maine, where he was also made consistorial councilor, and G. received his first education at the gymnasium of that city, and afterward studied theology at Tübingen, where the old dogmatic was still predominant; at Halle, where Semler influenced his whole after-life; and at Leipsic, where he became acquainted with Ernesti. Having applied himself specially to the criticism of the New Testament text, which had become a favorite study among theologians, G. undertook a journey to various libraries of Germany and Holland, to London, Oxford, Cambridge, and Paris. On his return, he published *De Codicibus Evangeliorum Origenianis* (1771), and commenced lecturing as *Privat-docent* in Halle. In 1773, he was made extraordinary prof., but 1776 was called as ordinary prof. to Jena, where he continued with great success, and many honors, till his death. The great work with which his name is associated is his critical revision of the New Testament Greek text. Besides pointing out new sources for discovery of the original reading, attempting a history of the sacred text (*Curæ in Historiam Textus Epp. Paul.*, 1777), and laying down more certain laws of criticism (*Symbolæ Criticæ ad Supplendas et Corrigendas Varias Lectiones N. Test.*, 2 vols. 1785-93), G. was the first who dared to print the New Testament text, as he had been enabled to determine it by his critical science. The first specimen that he published was *Synopsis Evangeliorum* (2 vols. 1774-5; 2d ed. 1809). This was followed, 1775-77, by an edition of the whole New Testament, published again 1796-1806, and of which a re-issue was begun by D. Schulz 1827, but not completed. The second ed. has been twice reprinted in London, 1809 and 18; an American ed. was published

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Boston 1808. Besides smaller editions, a splendid one in 4to was published by Göschen at Leipsic 1803-07. G.'s other works, *Populäre Dogmatik* (1779; 4th ed., 1789), *Commentarius Criticus in Textum N. Test.* (2 vols. 1798-1811), and the *Opuscula Academica* (2 vols. 1824-5, edited by Gabler), are now less known. A competent authority, comparing G. with those who had preceded him in his department, pronounced G. 'the most consummate critic that ever undertook an edition of the New Testament.' The grand feature of G.'s critical system is his threefold division or classification of the New Testament mss.: these divisions which he called 'recensions,' or 'codices,' consisted of—1. The Alexandrine recension; 2. The Latin or Western recension; 3. The Byzantine or Eastern recension. G. endeavors to show that the early Fathers, according to their locality, made use of a particular set of mss., exhibiting certain peculiarities such as justify the above division. G. expressed his decided preference for the Alexandrine recension, both in regard to antiquity and purity; the Byzantine he considered the least trustworthy. In the construction of his text he took the Elzevir edition as his basis. Among the most memorable of G.'s triumphs as a critic is his exposure of the interpolation of the well-known passage relative to the doctrine of the Trinity, I John v. 7. His life has been written by Köthe (Jena 1812), Augusti (Berl. 1812), and Eichstädt (Jena 1815).

GRIEVE, n. *grēv* [AS. *gerefa*, a governor; Ger. *graf* and *gravo*, an elder, a count (see REEVE 1)]: a farm overseer; an overseer of any work; a bailiff.

GRIEVE, GRIEVOUS, etc.: see under GRIEF.

GRIFFIN, n. *grīf'fīn*, also GRIFF'FON, n. *-fōn* [F. *griffon*; L. *gryphus* for *gryps*; Gr. *grups*, a griffin: Gr. *grupos*, carved, hook-nosed]: fabulous chimerical creature, which the fancy of the modern has adopted from that of the ancient world. The G. is mentioned first by Aristeas, perhaps about B.C. 560 (see Liddell and Scott's *Gr. Dic.*), though the accounts of Aristeas seem about as fabulous as those of the G. (see Smith's *Dic. of Gr. and Rom. Biog.*). For the origin of such monstrous conceptions in general, see DRAGON. The G. is variously described and represented, but the shape most frequent is that of an animal generated between a lion and an eagle, having the body and legs of the former, with the beak and wings of the latter. In this form it appears on antique coins, and as an ornament in classical architecture. Like all other monsters, griffins abound in the legendary tales of the Teutonic nations, and the name in various forms, slightly differing [Ger. *Greif*, Dan. *Grif*, etc.], is in most Teutonic dialects. Whether in the two cases both the name and the notion might not be traceable to a common source, or whether it was through barbarian or classical channels that they found their way into the nomenclature and the practice of heralds, are subjects of doubt. There are few fabulous conceptions with which heraldry is more conversant than the G. Nor were they regarded by the patriarchs of that science always as

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mere creatures of the imagination, for incredible as it may seem, we find Gerard Leigh, a herald of great repute in the time of Elizabeth, talking of them with entire sincerity as existing animals, 'I think they are of great hugeness,' he says 'for *I have a claw of one of their paws*, which should



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show them to be as big as two lions.'—See Newton's *Display of Heraldry*, p. 126. In the heraldic G., the claws of the eagle are usually substituted for the fore-paws of the lion, the creature being represented as in the accompanying wood-cut. Gwillim blazons a G. in this attitude 'rampant,' alleging that any fierce animal may be so blazoned as well as a lion: but the more appropriate and usual term is 'Segreant.' In representing the G., the ears ought not to be omitted, as they indicate the attribute of watchfulness, which, with strength and swiftness, were essential in the classical conception of his character. See WYVERN.

The name GRIFFIN, in natural history, is sometimes appropriated, as by Cuvier, to the genus *Gypaëtos*, of which the LÄMMERGEIER (q.v.) is the best known species; while in France it is generally bestowed, under the slightly modified form *griffon*, on the TAWNY VULTURE (*Vultur* or *Gyps fulvus*), called also the G. Vulture or Griffon Vulture, a bird which inhabits most of the high mountainous regions of Europe, as well as those of n. and central Asia, and n. Africa. A specimen was caught in s. Ireland 1843. the only one known to have found its own way to the British Islands. The G. Vulture is more than four ft. in length; it is of yellowish-brown color, with darker quills and tail; the head and upper part of the neck covered with short white down, the lower part of the neck surrounded with a ruff of long slender white down. Its habits are those of vultures in general. The term G. is familiarly applied in England, to a young man going for the first time to India.

GRIFFIN, *grif'in*, CHARLES: 1826-1867, Sep 15; b. Licking co., O.: soldier. He graduated at the U. S. Milit. Acad. 1847, entered the army as brev. 2d lieut., 2d U. S. artill.; served in the Mexican war, was promoted 2d lieut. 1847, Oct; 1st lieut. 1849, June; capt. 1861; brig.gen. of vols. 1862, June 9; brevet maj.gen. of vols., and col. U. S. A. 1864, Aug.; brevet brig. gen. and maj. gen. U.S.A. 1865, May 13th; col. of 35th U. S. inf. 1866, July 28; and fell a victim to yellow fever in Galveston. He was appointed commander of the 5th army corps 1865, Apr. 1, was a commissioner to carry out the terms of Gen. Lee's surrender, and received the arms and colors of the army of N. Va. after the surrender.

GRIFFIN, CYRUS: 1749-1810, Dec. 14; b. Va.: lawyer. He was educated and married in England, and became a member of the Va. legislature, congress 1778-81 and 1787-8, pres. of congress 1788, pres. of the supreme court of admiralty so long as it existed, commissioner to the Creek nation 1789, and judge of the U. S. dist. court of Va. 1789, Dec.; till his death.

GRIFFIN—GRIG.

GRIFFIN, EDWARD DORR, D.D.: 1770, Jan. 6—1837, Nov. 8; b. East Haddam, Conn.; Congl. and Presb. minister. He graduated at Yale College 1790, studied theol., was installed pastor of the Congl. Church in West Hartford, Conn., 1795; became colleague of Rev. Dr. McWharter in the First Presb. Church, Newark, N. J., 1801; was pastor there 1807–09; prof. of sacred rhetoric in Andover Theol. Seminary 1809–11; pastor of Second Presb. Church, Newark, 1815–21; and pres. of Williams College 1821–36. He had great pungency and power as a preacher.

GRIFFIN, GERALD JOSEPH: 1803, Dec. 12—1840, June 12, b. Limerick, Ireland; novelist. In early life he engaged in dramatic study, and wrote two tragedies *Aguirre* and *Gisippus*. He went to London 1823, and being unable to dispose of his works, became a newspaper and magazine writer. Beside writing many poems of merit, he published *Holland-Tide* (1827); *Tales of the Munster Festivals* (1827); *The Colleen Bawn* (1828); *The Invasion*; *The Rivals*; *The Duke of Monmouth*; and other novels. He became a member of the Soc. of Christian Brothers 1838, took the name of Brother Josephus, and died in the monastery at N. Cork. *The Colleen Bawn* was his most successful novel, and his tragedy *Gisippus* was performed at the Drury Lane Theatre after his death.

GRIFFIS, grif'is, WILLIAM ELLIOT, D.D.: Congl. minister: b. Philadelphia, 1843, Sep. 17. He served during a part of the civil war in the 44th Penn. vols.; graduated at Rutgers College 1869, entered the service of the Japanese govt. to organize schools on the American plan 1871, was prof. of physical science in the Imperial Univ at Tokio, 1872–74; returned to the United States and studied theology, graduated at the Union Theol. Seminary 1877, was pastor of the First Ref. Church, Schenectady, N. Y., 1877–86, and then became pastor of the Shawmut Congl. Church, Boston; and (1894) of the Congl. Church at Ithaca, N. Y. Dr. G. has published *The New Japan Series of Reading Books*, 5 vols. (Yokohama and San Francisco 1872–3); *The Tokio Guide*; *The Yokohama Guide*; *Map of Tokio with Notes* (1874); *The Mikado's Empire* (New York 1876, 5th ed. 1887); *Japanese Fairy World* (Schenectady 1880); *Schenectady First Church Memorial* (1880); *Asiatic History, China, Corea, and Japan* (New York 1881); *Corea, the Hermit Nation* (1882); *Corea, Without and Within* (1884, 2d ed. 1885); *Life of Commodore Matthew Calbraith Perry* (1886); and *Brave Little Holland*, magnifying the Dutch influence in history. He has written many Cyclopedic articles on Japan and Corea.

GRIG, n. grig [from its *wriggling* motion: Norw. *krak* or *krik*, a little creature: Dut. *kriek*, a cricket]: a small eel; a sand-eel; a grasshopper or cricket. AS MERRY AS A GRIG, exceedingly lively and happy, expressed by physical motions, compared to the very lively motions of the grig. *Note.*—As merry as a cricket is a phrase used in the same sense; but Skeat says as merry as a grig is of independent origin, or may simply be the corruption of the older phrase *as merry as a Greek*,

GRIGORIOPOL—GRIMALKIN.

GRIGORIOPOL, *grê-gô-rê-ô'pôl*: town of Kherson. γ . Russia, on the left bank of the Dniester, 80 m. n.w. of Odessa. Pop. 7,000.

GRILL, *v. grîl* [F. *griller*, to broil—from *grille*, an iron grate—from mid. L. *cratic'ula*, a gridiron]: to dress or broil on a gridiron; to harass: *N.* that which is broiled on a gridiron; the large gridiron so used. **GRILLING**, *imp.* **GRILLED**, *pp. grîld*: **ADJ.** broiled on a gridiron. **GRILLADE'**, *n. -lad'*, the act of grilling; something broiled.

GRILLE, *n. grîl*: open grate or grating; lattice work of metal; used as a screen for a tomb, relic, shrine, etc.; the gate or entrance to a religious house or sacred building; a small screen in the outer door of a monastic or conventual building, to allow conversation without opening the door.

GRILLPARZER, *grîl pâr-tsir*, **FRANZ**: 1790, Jan. 15--1872, Jan. 21; b. Vienna: Austrian dramatic poet. He attracted the notice of the public in 1816 by a tragedy, *Die Ahnfrau* (The Grandmother). In 1819 appeared *Sappho*, and 1822 *Das Goldene Vliesz* (The Golden Fleece), which, though they had small success on the stage, were highly admired as literary productions. The most important of his subsequent works are *König Ottokar's Glück und Ende* (King Ottokar's Fortune and End, 1825), a tragedy regarded by some as his masterpiece; *Melusina* (Vienna 1833); *Des Meeres und der Liebe Wellen* (The Waves of Love and of the Sea, 1840), founded on the story of Hero and Leander, and remarkable not only for its particular beauties, but also as a whole for its unusual delicacy and simplicity; and *Der Traum im Leben* (The Dream of Life, 1840), a richly poetical drama. G. wrote also some comedies, and several very beautiful lyric poems, which reveal a half-suppressed but genuine love of liberty. G. became the most popular author of the day in Austria. He was of a contemplative and retiring nature; he had a strong and penetrating intellect, and at times gave keen epigrammatic thrusts.

GRILSE, *n. grîls*: in *Scot.*, a salmon not fully grown, usually one in its second year: see **SALMON**.

GRIM, *a. grîm* [Ger. *grimm*, fury, wrath: Dan. *grîm*, ugly, grim: Ger. *grimmig*, crabbed, enraged: Icel. *grímmr*, stern: W. *grem*, a grinding or gnashing of the teeth]: ugly and fierce; stern and surly; impressing terror and alarm. **GRIM'LY**, *a. -li*, in *OE.*, having a frightful or hideous look: **AD.** in a grim manner; hideously. **GRIM'NESS**, *n.* fierceness of look; sternness. **GRIM-FACED**, having a grisly appearance, and stern scowling look.—**SYN.** of 'grim': ghastly; grisly; fierce; surly; frightful; horrid; horrible; ferocious; furious; stern; sullen; sour; hideous; ugly.

GRIMACE, *n. grî-mās'* [F. *grimace*, a crabbed look: Dut. *grimmen*, to snarl, to grin: Icel. *gríma*, a masque: It. *grima*, wrinkled: comp. Gael *grímeach*, grim, surly]: a snarled, crabbed look; a wry face; a distortion of face from habit, affectation, or insolence. **GRIMACED**, *a. grî-māst'*, distorted.

GRIMALKIN, *n. grî-māl'kîn* | *grî*, a corruption of *gray*,

GRIME—GRIMM.

and *malikin*, a dim. of *mail*, *moll*, or *mawkin*, for *Mary*, a scarecrow]: an old cat; a fiend supposed to resemble an old gray cat. *Note*.—On the other hand, we have GRIMALKIN, the fiend of old poetry, the Gael. *grim-maol-ceann*, the grim-bald head—from *grimeach*, fierce; *maol*, bald; *ceann*, head—see Dr. C. Mackay. The meanings attached to this word are confused, and so are the etymons. We have in Scot. *maukin*, Gael. *maigheach*, a hare; the primary sense, as in Shakespeare, is ‘a hare, a witch who could transform herself into a hare’; popularly a hare is called a *puss*.

GRIME, *n.* *grīm* (Norw. *grima*; Dan. *grime*, a streak or spot of dirt on the face: Icel. *grima*, a blackened face, a mask: It. *groma*, the dirt that sticks to anything]: foul matter; dirt; a blackness and foulness not easily cleansed: *V.* to foul or soil deeply. GRIMING, *imp.* GRIMED, *pp.* *grīmd*. GRIMY, *a.* *grīmī*, dirty; foul.

GRIMKÉ, *grīm'ke*, ANGELINA EMILY: abolitionist: 1805, Feb. 20—1879; b. Charleston, S. C.: daughter of Judge John Faucheraud G. She received a liberal education, removed to Philadelphia and joined the Soc. of Friends 1828; emancipated the slaves inherited from her parents 1836, and with her sister Sarah began lecturing against slavery in New York the same year. She married Theodore Dwight Weld 1838. The G. sisters attained wide repute for their eloquence, lectured through New England for the Mass. Anti-Slavery Soc., and published numerous letters, pamphlets, and other works on slavery, abolitionism, and women's rights. Angelina afterward was associated with her husband in his educational and reformatory labors. Her brother, THOMAS SMITH G., LL.D.: 1786, Sep. 26—1834, Oct. 11; b. Charleston: lawyer, scholar, and reformer: graduated at Yale College 1807, studied law in Charleston, and attained marked eminence at the bar. He was a member of the state senate 1826–30, supported the federal govt.'s tariff measure 1828, and opposed with much vigor the state nullification schemes. He was a fine classical scholar, yet deprecated the general study of the classics and mathematics in the United States, was one of the earliest temperance orators and advocate of spelling reform, and wrote and spoke frequently in behalf of peace, human freedom, education, and the Sunday-school.

GRIMKÉ, SARAH MOORE: abolitionist and reformer: 1792, Nov. 6—1873, Dec. 23; b. Charleston; sister of Angelina E. She removed to Philadelphia, and joined the Soc. of Friends 1821, set free her inherited slaves 1836, became an active member of the American Anti-Slavery Soc., and after the marriage of her sister Angelina made her home with the Weld family, and was a teacher in their schools at Belleville, N. J., 1840, Englewood, N. J., 1854, West Newton, Mass., 1863, and Hyde Park, Mass., 1864. She published *An Epistle to the Clergy of the Southern States* (1827), *Letters on the Condition of Woman and the Equality of the Sexes* (1838), a translation of Lamartine's *Joan of Arc* (1867), and several smaller works.

GRIMM, *grīm*, FRIEDRICH MELCHIOR, Baron von: 1723,

GRIMM.

Dec. 25—1807, Dec. 19; b. Regensburg, Bavaria: eminent critic of the 18th c., who, during his long residence in Paris, was intimate with the most celebrated personages of the day. Having completed his studies, he accompanied the young Count de Schönberg to the univ. at Leipsic, and afterward to Paris. Here he became reader to the crown-prince of Saxe-Gotha, but the situation was not remunerative, and G. was in straitened circumstances when he became acquainted with Rousseau. The latter introduced him to Diderot, Baron Holbach, Madame d'Epinay, and other distinguished persons, and he soon became a general favorite. His connection with the encyclopedists (q.v.), and his multifarious acquirements and versatility of mind, soon opened to him a brilliant career. He became sec. to the Duke of Orleans, and began to write his literary bulletins for several German princes, containing the ablest analysis of all the most important French works: in these he is believed to have been assisted by the Abbé Raynal and Diderot. 1776 he was raised by the Duke of Gotha to the rank of baron, and appointed minister-plenipotentiary at the French court. On the breaking out of the Revolution, he withdrew to Gotha, and 1793 the empress of Russia appointed him her minister-plenipotentiary at Hamburg. In ill-health, he returned to Gotha, where he died. His *Correspondance Littéraire, Philosophique et Critique*, was published after his death, 16 vols. A supplement is the *Correspondance inédite Grimm et Diderot* (Paris 1829, containing a complete history of French literature, 1753-90, and remarkable for brilliant and piquant criticism.

GRIMM, JAKOB LUDWIG KARL: 1785, Jan. 4—1863, Sep.; b. Hanau, in Hesse-Cassel: German philologist and antiquary. He was educated in classical and legal studies at Marburg, and visited Paris, where he pursued a variety of studies, especially mediæval literature. On his return to Germany, he was appointed sec. to the minister of war at Hesse-Cassel, and became successively librarian of Wilhelmshöhe, and auditor to the council of state. In 1814, he was sec. to the ambassador of the Elector of Hesse, whom he attended at Paris, and at the Congress of Vienna. In 1815, he was appointed a commissioner by the Prussian govt. to claim the restoration of valuable manuscripts, which had been removed to Paris by the armies of Napoleon I. In 1830, he received the appointment of prof. of German literature, and librarian of the Univ. of Göttingen. In this position he gave seven years to the study of the language, ancient laws, history, and literature of Germany. He was one of the seven professors who protested 1837 against the abolition of the constitution by the king of Hanover, for which act he was outlawed, and obliged to retire to Cassel. 1841 he was invited to Berlin, where, as member of the Acad., he was entitled to give lectures. He sat as a member of the Assembly of Frankfurt 1848. Though holding at various times important public offices, his life was devoted to philological and antiquarian studies, and to works which are mines of erudition, results of

GRIMM—GRIMM'S LAW.

wonderful industry combined with enthusiasm for everything German. His German *Grammar*, four vols., vol. I. published 1819, vol. IV. 1837, is perhaps the greatest philological work of the age; it may be said to have laid the foundation of the *historical* investigation of language. It traces the German language through all its dialects. Some idea of its thoroughness may be got from the fact that the vowels and consonants alone occupy 600 pages. His *Deutsche Rechts-Alterthümer* (Antiquities of German Law, 1828), and *Deutsche Mythologie* (German Mythology, 1835), are exhaustive works on the society of the middle ages in central Europe, and the religious traditions and superstitions from the earliest times. His *Geschichte der Deutschen Sprache* (History of the German Language), and *Ueber den Ursprung der Sprache* (On the Origin of Language), are works of great importance. In company with his brother Wilhelm, he published numerous works of more popular character, the best known of which is *Kinder und Hausmärchen* (Nursery and Fireside Stories). The greatest joint undertaking of the two brothers (now carried on by other scholars) is the *Deutsches Wörterbuch*, begun 1852, and yet far from completion. See GRIMM'S LAW.

GRIMM, WILHELM KARL: 1786, Feb. 24—1859, Dec.; b. Hanau, in Hesse-Cassel; brother of Jakob Ludwig Karl G. He was the companion of his elder brother at the Lyceum of Cassel, and the Univ. of Marburg. 1814, he was sec. of the librarian of Cassel, and removing to Göttingen 1830, was appointed under-librarian and supernumerary prof. of philosophy. He joined his brother in the protest against the king of Hanover, shared his exile, and his call to Berlin. From boyhood through life they were almost inseparable companions; they labored together, and were commonly known as the Brothers Grimm. Among the works of G. are—*Translation of Ancient Danish Heroic Poems of the Sixth Century*; *German Runic Characters*; *Heroic Legends of Germany*, etc.

GRIMMA, grîm'mâ: small town of Saxony, in the circle of Leipsic, 18 m. s.e. of the town of Leipsic; attractively situated in a hollow on the left bank of the Mulde. In the middle ages, its importance as a trading town was much greater than at present, and the flourishing manufactures in cloth, flannels, hosiery, cottons, and linens, for which it was noted, have now almost disappeared. The people support themselves by manufactures and agriculture. Among the public buildings are the royal castle, now used as a court-house and the ancient town-hall. Pop. (1880) 8,042.

GRIMM'S LAW: the name—derived from the discoverer, Jacob Ludwig Karl Grimm (q.v.)—given to the principle which regulates the interchange of the mute consonants in the corresponding words of the different Aryan languages. A historical survey of this family of tongues shows the consonants to go through a cycle of changes (Ger. *Lautverschiebung*). What, for example, was a *p* in the original form of a word, or, at least, in the oldest form

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known, is found at a later stage transformed into *f*, which next passes into *b*; and this again tends to become *p*, and go through the cycle anew. The following table exhibits the transitions that manifest themselves in regard to the Greek, Gothic, and Old High German:

	Labials.			Dentals.			Gutturals.		
Greek (Latin, Sanskrit),	p	b	f	t	d	th	k	g	ch
Gothic, - - -	f	p	b	th	t	d		k	g
Old High German, -	b(v)	f	p	d	z	t	g	ch	k

There are of course many exceptions, through the influence of adjoining letters and other accidental causes. The following are examples of the law:

Sanskrit.	Greek.	Latin.	Gothic.	Old High German.
pâda-s	pod-os	pedis	fôtus	vuoz
pitrî	pater	pater	fadrein (pl)	vatar
bhri	phero	fero	baira	piru
tvam	tu	tu	thu	du
trayas	treis	tres	threis	dri
pacu	poû	pecus	faiha	vihu

It is the High German dialects that the action of this principle is most marked. In the Teutonic tongues of the 'low' type, of which English is one, the consonants have remained at the same stage of development that they had attained in the Gothic (e.g. Eng. *father*, *foot*, *bear*, *three*—see corresponding examples above); the Old High German exhibits a third stage; and in modern High German the principle seems still at work, though its development is hindered by the crystallizing effect of written language.

GRIMSBY, GREAT, *grîmz'bi*: parliamentary and municipal borough, seaport, and market-town of England, county of Lincoln, on the right bank of the Humber, 40 m. n.e. of the town of Lincoln. It consists of two portions—the older, comprising a number of streets irregularly laid out, is at the head of the harbor; and the newer part, called the 'Marsh,' extends along the e. side of the harbor, and is regular and spacious. The parish church, a good specimen of the English pointed style, is an elegant cruciform structure, with a tower containing eight bells rising from the centre. Among its institutions G. has a free grammar-school, a national school, and other educational establishments; a mechanics' institute and a new town-hall. Here are an extensive and commodious suite of docks opened 1852, March, spacious enough to receive the largest ships of war; several ship-building yards, mills, and a tanyard and brewery. G., however, is now chiefly famous for its immense fishing trade. A people's park of 27 acres presented to the town was opened 1883. The constituency (8,700 in number) sends one member to the house of commons. In 1880, 3,722 vessels, of 631,738 tons, entered, and 3,494, of 619,967 tons, cleared the port. Pop. (1871) of municipal borough, 20,244, (1881) 29,682; of parliamentary borough (1881) 45,373, (1891) 51,876.

G. was formerly a port of such importance that, in the reign of Edward III., it sent 11 ships to aid that monarch in his expedition against Calais. But the gradual silting up of the harbor reduced it to comparative insignificance.

GRIN—GRINDAL.

Its present prosperity dates from the beginning of this century, when improvement of the harbor was begun.

GRIN, v. *grĭn* [Dut. *grijnen*, to weep: Icel. *grenja*, to howl: Ger. *greinen*, to grin: Norw. *grĭna*, to wry the mouth: F. *gronder*, to snarl: L. *ringi*, to open wide the mouth, to show the teeth: comp. Gael. *greann*, a surly, angry look: an imitative word]: to close or clinch the teeth and open the lips, as in mirth, scorn, or anguish; to show the teeth and snarl like a dog: N. the act of closing the teeth and showing them; an affected laugh. GRINNING, imp.: ADJ. showing a grin. GRINNED, pp. *grĭnd*. GRINNER, n. one who. GRINNINGLY, ad. -*lĭ*.

GRIND, v. *grĭnd* [Dut. *grĭmmen*, or *grĭnden*, to grin, to grind the teeth—from *grinding the teeth*, the term being transferred to the breaking small by a mill: an imitative word]: to break and reduce to powder by friction or rubbing, as between stones; to sharpen or polish; to oppress by severe exactions; in *familiar language*, to prepare a student for examination, or to prepare one's self; to perform the operation of grinding. GRINDING, imp.: ADJ. harassing; oppressing: N. act or process by which anything is ground (see below): the act of preparing one's self for examination. GROUND, pt. and pp. *grōund*, did *grĭnd*. GRINDER, n. one who, or that which; a back or molar tooth. GRINDSTONE, n. a flat circular piece of sandstone or sandstone-grit, made to revolve on an axis, and used for sharpening tools, and for grinding steel, glass, and other stones: they are of various degrees of coarseness for various purposes. Some of the best grindstones in the United States are from Berea, O. Artificial grindstones are made of emery, sometimes 3 ft. in diameter, and strong enough to be driven at the rate of 6,000 ft. per minute, at which rate they easily cut tempered steel: see GRINDING (below).

GRINDAL, *grĭn'del*, EDMUND, Archbishop, of Canterbury: 1519–1583, July 6; b. Kensington, England. He was educated at Cambridge, became pres. of Pembroke Hall 1549, chaplain to Bp. Ridley 1550, precentor of St. Paul's and chaplain to Edward VI. 1551, and prebendary of Westminster 1552. He removed to Strasburg on the accession of Queen Mary, and spent 5 years collecting the writings and personal notes of the 'learned and pious sufferers in England,' which afterward formed a large part of Fox's *Book of Martyrs*. In 1558 he returned to England and was selected as one of a committee to prepare a new liturgy and also as one of the 8 Prot. divines to oppose the Rom. Cath. prelates in public debate. In the following year he became master of Pembroke Hall and succeeded Dr. Bonner as bp. of London. With Abp. Parker he suspended those of the London clergy who refused to submit to the 'Act of Uniformity,' and was nearly mobbed by the wives of the suspended clergy 1565. In 1570 he was translated to the see of York, and 1576 succeeded Dr. Parker as abp. of Canterbury. He soon incurred the displeasure of Queen Elizabeth by declining to break up the meetings of the clergy for mutual improvement, and was confined to his

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house and suspended from ecclesiastical functions by order of the 'star chamber.' Subsequently he was partially restored to power, became blind, resigned his office 1583, Apr., and was pensioned. His literary remains were published by the Parker Soc. of London.

GRINDELWALD, *grin'del-vált*: one of the most beautiful of the high Alpine valleys, 35 m. from the city of Bern; about 12 m. long and 4 m. broad. G. owes its celebrity as a resort for travellers to two great glaciers, branches of arms of the immense ocean of ice which covers the Bernese Oberland. The village of G., consisting of a number of widely scattered cottages, with about 3,500 inhabitants, is about 3,600 ft. above sea level.

GRIND'ING: operation of shaping any hard substance by rubbing away its surface with a rough stone or with a cutting powder. It is similar to filing, and is used in cases where, from the hardness of the material, or for other reasons, filing is inapplicable. Thus cutting tools and other steel instruments may be filed before hardening and tempering; but after this, if further abrasion is required, they must be ground. Glass lenses and metal specula are ground to their shape with emery-powder laid on a metal tool. Ornamental glass is ground into facets or otherwise by means of stones and lap-wheels. Diamonds and other gems are ground or cut with diamond-dust imbedded in soft iron. When large flat surfaces are required, they are obtained by first working two pieces of the substance nearly flat, and then laying one upon the other, and grinding their surfaces together with sand, emery, or other suitable cutting powder. Plate-glass is flattened in this manner; also surfaces of cast iron where accurate fitting is required, the iron surface being either prepared with a planing-machine, or by turning in a lathe with a slide-rest. Sockets and other bearings which require to be fitted with great accuracy are finished usually by grinding together. For brass and bell metal powdered pumice-stone is best adapted for such purposes, as emery is liable to imbed itself in the metal, and give it a permanent action upon the bearings.

Dry grinding is the term applied to the grinding of steel with dry grindstones. Its principal applications are in grinding the points of needles and forks, the surfaces of gun-barrels, and in finishing steel-pens. This kind of work produces painful irritation in the throat and nostrils of those who follow it; and though the distressing effects have been much diminished of late by the introduction of currents of air to carry away the particles of steel, and mouth-pieces of damp cloth, the evil is not entirely obviated; in some branches, such as gun-barrel grinding, it is still very great. Besides this evil, the stones used for gun-barrel grinding, which are very large, revolve with great rapidity, and occasionally break or 'burst' with great force while revolving, and seriously endanger the lives of the men. See GRINDSTONE.

A distinct kind of grinding is that of crushing and rubbing a substance into a fine powder. This is effected by

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passing the substance between rough stones, as in the common flour-mill, or between rollers, either smooth or toothed, according to the degree of fineness required, or by a heavy stone or iron cylinder revolving upon a smooth plate. Colors are ground in small quantities with a *muller and slab*. The muller is a heavy piece of stone of somewhat conical shape, and which rests on its base upon the slab of stone, and is grasped by the hands, and the color is mixed to a pasty consistence with the required medium of oil or water, and rubbed between the two surfaces until smooth and impalpable. On a large scale, iron or stone cylinders revolve on a slab in such a manner that they shall not merely roll but shall also rub upon the surface of the slab. A knife or scoop follows one cylinder and precedes the other, scooping the paste into the position required to come fairly under the cylinder which follows it. Chocolate, spices, plumbago for crucibles, and a variety of other substances, are ground thus.

GRINNELL, *grĭn-ĕl'*: city in Poweshiek co., Io.; at the crossing of the Central Io. and the Chicago Rock Island and Pacific railroads and terminus of the Montezuma Branch railroad; 26 m. s.s.e. of Marshalltown, 55 m. e. b. n. of Des Moines. It was founded by a colony headed by the Rev. J. B. Grinnell. It contains 6 churches, 2 national banks (cap. \$200,000), 1 state bank (cap. \$50,000), 1 private bank, several public schools, foundry, glove factory, and several flouring mills, and is in a rich farming region. It is the seat of Iowa College (Congl.), the oldest college in the state, founded 1846, opened at Davenport 1848, and removed to G. 1858. The college grounds cover 30 acres and contain Blair Hall, Chicago Hall, Alumni Hall, and Goodnow Hall, all substantial buildings and erected since 1882, when a tornado destroyed the former ones. The Rev. Dr. George F. Magoun was pres. 1864-84, the Rev. George A. Gates became pres. 1887, and Daniel F. Bradley, D.D., 1901. Pop. (1900) 3,860.

GRINNELL', HENRY: 1799, Feb. 13—1874, June 30; b. New Bedford, Mass.: merchant. He graduated at the New Bedford Acad. and became a clerk in a New York commission house 1818. Soon afterward he became a partner in the whale-oil shipping firm of Grinnell, Minturn & Co., with which he remained actively connected till his retirement from business 1849. He was an earnest friend of seamen, first pres. of the American Geographical Soc. 1852-3, and vice-pres. 1854-72. He is remembered for his liberal aid in extending a knowledge of arctic geography. In 1850 he bore the entire expense of an expedition to search for the English arctic explorer Sir John Franklin, of whom nothing had been heard for 5 years. This expedition started under command of Lieut. E. J. De Haven, U.S.N., with Dr. Elisha Kent Kane (q.v.), as surgeon and naturalist, discovered land in lat. 75° 24' 21", and named it in his honor Grinnell Land. In 1853 with George Peabody (q.v.) he fitted out a second expedition for the same object, of which Dr. Kane was commander, and to

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which the govt. gave large aid. This expedition first demonstrated the existence of an open polar sea, mapped the coast-line, and penetrated previously unknown regions. In 1860 he contributed largely to the expedition under Dr. Isaac Israel Hayes (q.v.), and 1871 to the unfortunate 'Polaris' expedition (see HALL, CHARLES FRANCIS).

GRINNELL', JOSIAH BUSHNELL: philanthropist: b. New Haven, Vt., 1821, Dec. 22. He graduated at Auburn Theol. Seminary 1847; was ordained a Presb. clergyman; held pastorates in Union Village, N. Y., Washington, and in a Congl. church in New York; removed to Io., founded the town of Grinnell and a Congl. church (1854), and preached there gratuitously several years; and subsequently engaged in wool-growing and railroad building. In 1856-60 he was member of the state senate; 1863-67 representative in congress as a republican; 1868 special agent of the treas. dep.; and 1884 was appointed commissioner of the U. S. bureau of animal industries. He aided in building 6 railroads; laid out 5 towns; founded Grinnell Univ., now merged in Iowa College, and was its pres.; contributed liberally to the new building fund of the college after the tornado of 1882; and has published many addresses and pamphlets, and *Home of the Badgers* (1845); and *Cattle Industries of the United States* (1884). He died Mar. 31, 1891.

GRINNELL LAND, *grĭn-ĕl'*: tract on the w. side of Kennedy Channel (northern continuation of Smith's Sound), which separates it from Greenland. It was discovered 1850, and named by a U. S. ship under command of Lieut. De Haven in the expedition sent out by Henry Grinnell (q.v.), merchant of New York. Next year an English expedition, in ignorance, called it Albert Land. The region is barren in the extreme, mountainous, and has many glaciers. Musk oxen are numerous. It was visited by the expedition under Nares, 1875-6.

GRIP, n. *grĭp* [Dut. *gruppe*, or *grippe*, a furrow: Ger. *grube*, a ditch—from *graben*, to dig: connected with GROOVE]: a little ditch or channel for surface-water.

GRIP, n. *grĭp* [see GRIPE]: a grasp; a holding fast; strength in grasping; a peculiar mode of clasping the hands; that by which anything is grasped: V. to grasp; to hold fast. GRIP'PING, imp. GRIPPED, pp. *grĭpt*.

GRIP, or GRIPE, n. *grĭp* [Gr. *grups*; L. *gryps*, a griffin—from Gr. *grupos*, curved]: in *OE.*, a griffin.

GRIPE, n. *grĭp* [Dut. *grijpen*; Ger. *greiffen*; Icel. *grípa*, to seize: F. *griffe*, a claw; *gripper*, to clutch or seize: It. *grifo*, a claw]: a clasping with the hand or arms; a hold; a grasp; pinching distress; oppression; pain in the bowels: V. to catch with the hand; to seize; to grasp; to pinch; to press; to cause a colicky pain in the bowels; in *nav.*, applied to a ship when she runs her head too much into the wind. GRIP'PING, imp.: ADJ. catching or holding, as in a gripe; distressing, as griping poverty: N. the sensation of pain or pinching; distress. *Griping*, or *Gripes*, is a popular name for all painful affections of the bowels, whether attended with constipation (q.v.) or diarrhœa (q.v.): when

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pains of this kind are spasmodic, they are termed colic (q. v.). The action of purgative medicine is often attended by more or less griping pain, which may be averted in some cases by careful choice of the medicine, or by combination of it with carminatives (q. v.), or with a little opium. GRIPED, pp. *gript*. GRIPER, n. one who. GRIPINGLY. ad. *li*.—SYN. of 'gripe, v.': to catch; snatch; squeeze; clasp; clutch; embrace; straiten; distress.

GRIPPE, *grîp*, LA: see DENGUE: INFLUENZA.

GRIPPLE, a. *grip'l* [dim. of GRIP 2 (see GRIPE)]: in *OE.*, eagerly desirous of clutching; greedy; covetous; oppressive. GRIPPLENESS, n. *grîp'l-nēs*, covetousness.

GRIQUALAND WEST AND EAST, *grē'kwa-lānd*: two territories in s. Africa, annexed 1871 to Cape Colony, and named from the Griquas or Bastaards, who are a mixed race, sprung from the intercourse of Dutch settlers with Hottentots and Bush women. Some of the Griquas are partially civilized; some are also professedly Christian.—*Griqualand West* lies n. e. of Cape Colony, is bounded on the s. by the Orange river, on the n. by Bechuana territory, on the e. by Orange Free State, on the w. by the Kalahari country. Portions of the country are suitable for sheep-farming and agriculture, but the chief source of wealth is the diamond-fields. The first diamond was discovered in 1867, and from that time a steady stream of emigration set in; settlements were formed, all nationalities being represented, and digging was vigorously prosecuted. Diamonds to the value of abt \$60,000,000 were found there 1871-80. The territory of the diamond-fields had been secured to Waterboer, a native chief, but disputes arising as to his boundaries, Griqualand West was annexed to Cape Colony, as British territory, 1871. Kimberley is the chief centre of the diamond industry, and is the seat of government. The chief settlements are De Beer, Du Toit's Pan, Bultfontein, Barkly, and Griqua Town. The estimated area of Griqualand West is 17,491 sq. m.; pop. (1891) 83,375, of which 29,570 are European whites.—*Griqualand East* is that part of No-Man's-Land which lies between the Kafir border and s. Natal. It was allotted to Adam Kok, who had removed thither with 15,000 Griquas, and to the Bassutos who had previously migrated into that country. This territory was annexed to the Cape Colony 1875. Wheat is cultivated in considerable quantities in the part occupied by the Griquas, and many of the Basutos living in the west are in comfortable circumstances. Pop. (1891) 153,618; whites 4,150.

GRIS, or GRISE, n. *grīs* [Icel. *griss*; Dan. *griis*, a pig]: in *Scot.* and *OE.*, a pig. GRISKIN, n. *grīs'kīn*, a sucking pig; a little pig; the roast spine or loin of pork [Gael. *grisg*, to roast]. *Note*.—There is here confusion arising from similarity of sound: *griskin*, 'a little pig,' appears to have its origin from *grīs*, a pig, *kin*, little: while *griskin*, a roast loin of pork, is apparently from Gael. *grisg*, to roast: we have also Gael. *grisgean*, a piece of roast meat of any kind.

GRIS-AMBER: used by Milton for AMBERGRIS (q. v.).

GRISE, n. *grēs*: in *OE.*, a step: see **GREE** 3, and **GREES**.

GRISELDA, *grī-zēl'dā*, or **GRISELDIS**, *grē-zēl'dīs*: heroine of a celebrated mediæval tale, which probably had its rise in Italy. A poor girl, who was a charcoal-burner, was raised to be the wife of the Marquis of Saluzzo, who put her humility and obedience to the severest tests. She, however, passed through them all triumphantly, and a reconciliation took place. In this legend, the endurance and self-renunciation of the loving woman are represented as carried to the highest pitch. We find the tradition worked up into a tale, said to be founded on fact, first in Boccaccio's *Decameron*; Petrarch translated it into Latin 1373, under the title *De Obedientia, et Fide Uxoriam*; and in the 14th c., the story was well known throughout Germany. In 1393, it was wrought into a 'mystery' play in Paris; in England, the drama of *The Patient Grissel* appeared 1599, and one on the same subject by Hans Sachs in Germany 1546. It forms the story of Chaucer's *Clerkes Tale*, and versions of it are found in most European literatures.

GRISSETTE, n. *grī zēt* [F.—from *gris*, gray]: originally a dress of common gray stuff; in *France*, a tradesman's wife or daughter; a shop-girl.

GRISI, *grē'zē*, **GIULIA**: 1810-69; b. Milan: celebrated vocalist. From a very early age she showed remarkable musical genius, accompanied by a voice of the rarest promise. At the age of 16, she first appeared in the opera of *Zelmira*, at Bologna, and gathered her earliest laurels by the inimitable quality, melodiousness, and fidelity of her voice, as well as by her pathetic and life-like impersonation of the rôle. Two years later, she appeared at Florence, and to no artist was pre-eminence ever more unanimously accorded. Her greatest early triumph was at La Scala, Milan, where she played the part of Norma in the tragic opera of that name. So thoroughly did she identify herself with this character, that hardly any subsequent singer has ventured on an original and independent personation. G.'s début at Paris 1832 was equally successful, and overcame the proverbial cynical apathy of the frequenters of the Théâtre Italien. London, however, was the scene of her grandest performances, and most appreciative audiences. G. was twice married, first, unhappily, to Mons. Gérard de Meley; secondly, to Signor Mario, eminent tenor.

GRISKIN, n. *grīs'kīn*: a dim. of **GRIS**, which see.

GRISLY, a. *grīz'li* [AS. *grislic*, grisly, dreadful: Bav. *gruseln*; prov. Ger. *grieseln*, to shudder: Gael. *gris*, horror]: frightful; horrible; hideous. **GRIS'LINESS**, n. the quality of being frightful to look at.

GRISLY, or **GRIZZLY**, a. *grīz'li* [see **GRIZZLE**]: speckled; of mingled black and white.

GRIS-NEZ (or **GRINEZ**), *grī-nā'*, **CAPE**: headland of France, dept. of Pas-de-Calais, opposite Dover. It is the point of land nearest the English shore, the distance being

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barely 21 m. Cape G. is about equally distant from Calais on the n.e. and Boulogne on the south. It is surmounted with a light-house, lat. 50° 52' n., and long. 1° 35' east.

GRISONS, n. *griz'üns* [F.; Ger. *Graubünden*]: most eastern of the Swiss cantons; also the largest and the most thinly peopled: bounded n. by St. Glarus, St. Gall, and the Vorarlberg; e. by the Tyrol; s. by Lombardy; w. by Uri and Ticino; 2,770 sq. m. The canton divides itself naturally into three great valley-districts, of which the first and most important lies along the course of the Rhine, and stretches northward, occupying nearly all the w. portion of the canton; and the second, forming the Engadine (q.v.), extends n.e. along the course of the Inn. The third valley-district comprises several smaller valleys whose streams run southward, belonging to the basins of the Ticino and the Adda. The whole canton is an assemblage of mountains intersected by narrow valleys. The climate is very varied, in some districts winter reigns nearly eight months, while some of the southern valleys resemble Italy. In the colder districts, scanty crops of barley and rye are raised with difficulty; while in the southern valleys, wheat, maize, and also the vine, fig, and almond are successfully cultivated. Pastures and forests occupy a large portion of the canton; and cattle, timber, and cheese are the principal exports. Iron, lead, copper, zinc, and silver are worked. The rivers abound in salmon and trout, and in the mountains are bears, wolves, lynxes, and wild-cats.

The country was anciently inhabited by the Rhætti, who are by some writers thought to be connected with the Etruscans (see ETRURIA). It was conquered by the Roman emperor Constantius in the 4th c., and his camp (*Curia*, *Chur*, or *Coire*, the name of the present capital) was planted on the Rhine. Chur has been a bishopric since 450. In the 10th c. the country of the G. was added to the German empire, and remained till 1268 subject to the Swabian dukes. With the decay of the imperial authority it came to be oppressed by a numerous nobility, the ruins of whose castles still crown the heights. Against them the people began, in the end of the 14th c., to form leagues in the different valleys. One of these leagues, formed 1424, was called the *gray* league (Ger. *der graue bund*; in the native language, *lia Grischa*), from the gray homespun worn by the unionists, hence the German and French names of the canton—Graubünden and Grisons. In 1472, these separate unions entered into a general federation, which then formed an alliance with the Swiss cantons. It was not till 1803 that G. was admitted into the Swiss confederation as the 15th canton. The constitution of G. is very complicated, and suffers from the lack of centralization incident to its origin. Of the inhabitants, who also are called Grisons, one-half speak German, and the others dialects derived from Latin. The dialects of the southern valleys are a kind of Italian; the Latin of the Engadine (q.v.) and the Romanese differ greatly from Italian, but are far from being Latin. Pop. (1880) 94,091, of whom abt. 41,000 are Rom. Catholics; (1888) 94,810; (1900) 104,520.

GRIST—GRISWOLD.

GRIST, n. *grĭst* [OF. *grust*, grain for grinding or for making beer: F. *gruau*, oatmeal]: corn for grinding; the grain carried by a customer to the mill at one time; that which is ground at one time; gain; profit. **GRIST-MILL**, originally a mill for grinding the quantities of grain brought by different customers. **GRIST TO THE MILL**, gain or profit. *Note*.—**GRIST** may be only an adaptation of F. *gris*, gray, in reference to the prevailing color of the oat-grain in its natural state, or after being dried. **GRIST** may also be regarded as another form of **GRITS** or **GROATS**.

GRISTLE, n. *grĭs'l* [O.Fris. *gristel*, gristle: Swiss, *krös-selen*, to crunch; *krospeler*, gristle: Pol. *grysc*, to gnaw: Dut. *krijsselen*; prov. Eng. *grist*, to grind the teeth]: soft bone which makes a peculiar crunching noise when bitten; in *animal bodies*, a smooth, solid, elastic substance, chiefly covering the ends of bones; cartilage. **GRISTLY**, a. *grĭs'li*, of or like gristle. **GRIST'LINESS**, n.

GRISWOLD, *grĭz'wold*, ALEXANDER VIETS, D.D.: 1776, Apr. 22—1843, Feb. 15; b. Simsbury, Conn.: Prot. Epis. bp. He studied law, worked on a farm, was confirmed in the church 1786, studied for the ministry, was ordained deacon 1795, June 3; and priest Oct. 1; and had charge of the parishes of Plymouth, Harwinton, and Litchfield, Conn. till 1804, when he became rector of St. Michael's Prot. Epis. Church, Bristol, R. I. In 1840, May, he was elected first bp. of the Eastern diocese, which then comprised Me., N. H., Vt., Mass., and R. I., and was consecrated in New York 1811, May 29. He became presiding bp. 1836, received the degree of D. D. from Brown Univ. 1810, Princeton College 1811, and Harvard College 1812, and published *Discourses on the Most Important Doctrines and Duties of the Christian Religion* (1830), *The Reformation and the Apostolic Office* (1843), and *Remarks on Social Prayer Meetings*.

GRISWOLD, MATTHEW, LL.D.: 1714, Mar. 25—1799, Apr. 28, b. Lyme, Conn.: lawyer. He was a member of the legislature 1751, council 1759, and committee of safety 1775. was chief justice of the superior court, lieut. gov. of the state, and gov. 1784–86; presided over the state convention that ratified the Federal constitution 1788, and received the degree LL.D. from Yale College 1779.

GRISWOLD, RUFUS WILMOT, D.D.: 1815, Feb. 15—1857, Aug. 27; b. Benson, Vt.: editor. In early life he travelled extensively in the United States and Europe, learned the printer's trade, became a Bapt. minister, afterward a journalist and editor. He was chief editor of *Graham's Magazine* 1841–43, and of the *International Magazine* (New York) 1850–52, and asst. editor of the *New Yorker*, *Brother Jonathan*, and *The New World*; compiled *Curiosities of American Literature*, edited the first American edition of Milton's prose works, and was one of the editors of the *Works of Edgar Allan Poe*, 3 vols, (1850). His published works include *Poets and Poetry of America* (Philadelphia 1842), *Biographical Annual* (1842), *Christian Ballads and Other Poems* (1844), *Poets and Poetry of England in the Nineteenth Century* (1845), *Prose Writers of America* (1846),

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Washington and the Generals of the Revolution (1847), *Napoleon and the Marshals of the Empire* (1847), *Female Poets of America* (1848), *Sacred Poets of England and America* (1849), *The Republican Court* (1854), and *Scenes in the Life of the Saviour*.

GRIT, n. *grit* [AS. *grest*, sand, dust: Icel. *griot*; O.Fris. *gret*, stones: Low Ger. *grut*, grit, gravel: F. *grès*, gritty stone]: any hard sandstone in which the component grains of quartz are coarse and less rounded or more angular than in ordinary sandstones—the grains being compacted with a hard siliceous cement (see **MILLSTONE GRIT**): rough hard particles: the coarse part of meal. **GRITTY**, a. *-tī*, containing sand or grit. **GRIT'TINESS**, n. the quality of consisting of hard particles or grit.

GRITS, n. plu. *grits*: the proper spelling of **GROATS**, which see.

GRIVEGNEE. *grē-vēn-yā*: manufacturing town of Belgium, about two m from Liege. Pop. 7,000.

GRIWENNICK, n. *grī-vēn'ik* [Rus.]: small silver coin current in Russia, equal to about eight cents.

GRIZZLE, n. *grizl* [F. and Sp. *gris*, gray: Dut. *grijs*, gray: Ger. *gris*, gray, an old man; *griese en*, to fall in morsels: F. *gresillé*, covered or hoary with rime]: a mixture of white and black; a gray color. **GRIZZLED**, a. *grizld*, gray; of a mixed color. **GRIZZLY**, a. *grizlī*, somewhat gray.

GROAN, n. *grōn* [Dut. *groonen*, to groan: W. *grion*, a broken or trembling noise: F. *gronder*, to snarl, to grunt: an imitative word]: a deep mournful sound uttered in pain, anguish, or sorrow: V. to utter a deep moaning sound; to be oppressed or afflicted. **GROANING**, imp.: N. the act of groaning; lamentation; complaint; a deep sound uttered in pain or sorrow. **GROANED**, pp. *grōnd*. **GROANFUL**, a. in *OE*, sad; agonizing.

GROAT, n. *grōt* [Dutch, *groot*, great; Ger. *groschen*; L. Ger. *grote*; Fr. *gros*, Ital. *grosso*; Low. Lat. *grossus*; from the same root as Eng. *great*, and meaning *thick*]: name given in the middle ages to all *thick* coins, as distinguished from the 'bracteates' [Lat. *bractea*, thin plate or leaf], or thin coins of silver or gold-leaf stamped so as to be hollow on one side and raised on the other. Groats differed greatly in value at different times and in different countries. The silver groat once current in England (introduced by Henry III.) was equal to four pence. The coin—not the name—was for a time revived in the modern fourpenny-piece; and the name familiarly denoted a small sum. Groschen were till lately current in n. Germany. The silver groaschen, or neugroschen of Prussia and the Zollverein, was $\frac{1}{30}$ th of a thaler, and worth $1\frac{1}{4}$ d. = a little more than two cents; the guter groschen of Hanover = $\frac{1}{24}$ th thaler = $1\frac{1}{2}$ d., = a little less than three cents.

GROATS, n. plu. *grōts* [Dut. *grut*; Ger. *grütze*, grain husked and more or less broken: Icel. *grautr*; Dan. *grød*, porridge: AS. *grut*, meal, wort; also locally *grits*, oats

GROCER—GRODNO.

that have the hulls or shell taken off (see **GROUT**); from the same root as *to grate*, to rub to powder; allied to Eng. *scratch*, and Lat. *rado*, to scrape]: the grain of oats deprived of the integuments, i.e., the hulls or shells: see **GROUT**.—Groats are much used for preparing *gruel* for invalids, and were formerly often used in broths and soups like pot-barley—*Embden Groats* are groats broken into small pieces by crushing. For the nutritive and other qualities of groats, see **MEAL: OATS**.

GROCER, n. *grô'sër* [F. *grossier*, a grocer; *grosserie*, the wholesale trade, wares sold by wholesale—from *gros*, gross, great]: one who sells tea, coffee, sugar, etc. **GRO'CERY**, n. -*z*, a grocer's shop or store. **GRO'CERIES**, n. plu. -*iz*, the articles sold by a grocer. **GROCERY** is also used in the sing. for articles sold at a grocer's.

GRODEK, *grô'děk*, or **GRUDEK**, *grô'děk*: town of Austrian Galicia, 15 m. w.s.w. of Lemberg, with which it is connected by railway; partly on a hill between two small lakes and partly on three small islands. Pop. (1880) 10,116, chiefly German colonists, including also some Jews.

GRODNO, *grôd'nô*: government of Russia, province of w. Russia, and formerly a portion of Lithuania; bounded n. by the govt. of Vilna, e. by that of Minsk, s. by Volhynia, w. by Poland and the province of Bialystok; 14,532 sq. m. The land is, in general, flat, and belongs in the s.w. to the basin of the Vistula, in the n. to that of the Niemen, and in the s.e. to that of the Dnieper. In the s. extensive morasses occur, though much marshy land has been already converted into pasture-ground by draining; and in the n. are extensive forests, chiefly of pine. The soil is light and sandy (except that of the river-valleys, which is clayey), and is in general fruitful. Rye is the principal agricultural product, the average annual yield being estimated at 2,346,000 English quarters. Barley, flax, hemp, hops, and timber are extensively raised. The bear, the lynx, and the buffalo are found in the forests. Cattle, sheep, and bees are largely reared. The chief branches of industry are the manufactures of cloth, hats, paper, and leather, and the principal exports are corn, cattle, wool, leather, hops, honey, and wax. Pop. (1882) 1,226,946; (1886) 1,373,384; (1897) 1,617,859.

GROD'NO: town of Russia, cap. of the govt. of G.; on an elevation on right bank of the Niemen. 160 m. n.e. of Warsaw. It has 14 churches and convents, several synagogues and castles, some ruinous palaces, belonging formerly to old Lithuanian families; a gymnasium; manufactures in cloth, silk, and weapons; and a flourishing trade, almost wholly in the hands of the Jews, who form about three-fourths of the population. The modern palace, erected here by Augustus III., is extensive and handsome. Other principal buildings are the market-place, the equestrian seminary, the high school, the academy for medical science, connected with which are a library, collection in natural history, and a botanic garden. Here, 1586, Stephen Bathori died in his own castle; and here, 1725, Nov.

GROG—GROLIER DE SERVIER.

25, Stanislas Augustus abdicated the Polish crown. Pop. (1882) 42,238; (1885) 39,826; (1897) 46,871.

GROG, n. *grög* [said to be so called from the nickname of Admiral Vernon, about 1745, who wore *grogram* breeches]: mixture of spirit and cold water not sweetened, served out as a beverage to men in the British, and formerly in the United States navy. In the British navy men who prefer to abstain from grog receive under recent regulations money or tea instead. In the United States navy, the ration of grog has long been abolished, but the commanding officer may at his discretion order it served in cases of necessity: V. to recover spirits absorbed in the wood of empty spirit-casks by treating them with water. **GROG'GING**, imp.: N. the act of recovering spirits from empty spirit-casks by treating them with water. **GROGGED**, pp. *grögd*. **GROG-SHOP**, or **GROG'GERY**, n. *-gër-ř*, a shop dealing in spirits. **GROG'GY**, a. *-gř*, tipsy. *Note*.—Gael. *cròc* denotes a horn, a drinking-cup. In Scot. 'to take a horn' is 'to take a cup of liquor': we say, 'to take a glass,' meaning the liquor in it: Eng. *grog* may have a connection with Gael. *cròc*—see Dr. C. Mackay.

GROGRAM, n. *grög'räm* [F. *grosgrain*, coarse grain—from *gros*, great; *grain*, grain]: a kind of stuff with large woof and a rough pile.

GROIN, n. *gröyn* [F. *groin*, a snout; Icel. *grein*, a branch, an arm: Dan. *green*, prong of a fork: Sw. *gren*, arm of a stream, fork of a pair of trousers]: in the human body, the depressed part between the belly and the thigh; the angular curve formed by the intersection of two arches.—**GROINED**, a. *gröynd*, having an angular curve formed by the intersection of two arches.—*Groined Vaulting* is that kind of vaulting in which the vault is not a plain barrel-vault from end to end, but where one vault cuts into another: the angle formed by the intersection is called the groin. In Roman architecture, the groins were generally left as a plain sharp edge; in Gothic, they were usually protected and strengthened with *ribs*: see **VAULT**.—**GROINS**, n. *gröynz* [OF. *groing*, a tongue of land jutting into the sea]: a frame of woodwork constructed across a beach, perpendicular to the general line of it, to retain or gather shingle.

GROLIER DE SERVIER, *gro-le-ä' deh sër-ve-ä'*, JOHN, Viscount d'Aguisy: 1479–1565, Oct.; b. Lyon: famous bibliophile. He was attached to the court of Francis I., and went to Italy as intendant-gen. of the army. He held several high civil posts and distinguished himself at Rome as diplomatist. He was a scholar and a powerful patron of men of learning. He died at Paris. G.'s library has made him famous. He acquired choice copies of the best works, and had them magnificently and tastefully bound, with the generous inscription, *Io. Grolierii et Amicorum* ('John Grolier's and his Friends'). The library was dispersed 1675, since which time volumes belonging to it are a great prize of wealthy book-collectors. Very large sums have been paid for single books.

GROMET—GRONINGEN.

GROMET, n., or **GROMMET**, n. *gröm'èt* [F. *gourmette*, a curb]: among *seamen*, a ring formed of a twist of rope laid in three times round.

GROMWELL, n. *gröm'wël* [OE. *gromell*: etymology unascertained], (*Lithospermum*): genus of plants of nat. ord. *Boraginæ*, having a funnel-shaped corolla, stamens shorter than the corolla, and *achenia* of stony hardness. Probably, on account of the last-mentioned character, extraordinary virtues were ascribed to them, particularly to the **COMMON G.** (*L. officinale*), in the cure of stone in the bladder: the virtues were merely imaginary. The **Common G.** is a native of dry gravelly places in Europe, Asia, and N. America. It has an erect much-branched stem, broadly lanceolate leaves, and small greenish-yellow flowers.—**CORN G.** (*L. arvense*) with small white flowers, is of equally wide geographic distribution.—Two species, natives of s. Europe, *L. tinctorium* and *L. anchusoides*, yield a dye-stuff similar to alkanet, and which passes under that name.

GRONINGEN, *grön'ing-èn*, D. *chrō'nīng-chèn* (ancient *Cruoninga*): northeastern province of the Netherlands, bounded n. by the North Sea, e. by Hanover, s. by the province of Drenthe, w. by that of Friesland; 896 sq. m. It is watered by the Hunse, navigable for large vessels from the town of G. to its mouth in the Lauwer Sea, and by other small streams, and by lakes and numerous canals. Its surface is flat, protected against the sea on the n. by dykes. The soil principally alluvium, forms excellent arable land. The n. of the province contains the best soil, and is one of the most densely peopled districts of the kingdom. Much of the land (toward the s. e.) is marshy, and lies in pasturage, which supports a fine breed of cattle, and great numbers of highly valued horses and sheep. Farming and grazing are chief pursuits of the people; fishing, commerce, and trade also are carried on, and some manufactures. Ship-building is extensive, and much butter is exported. The people are almost entirely of the Frisian race, and belong to the Reformed Church. Pop. (1879, Dec. 31,) 255,686; (1885) 265,687; (1890) 275,356; (1901) 305,781.

GRONINGEN: important fortified town of the Netherlands, cap. of the province of G.; on the Hunse, at confluence with the Aa 22 m. w. of Dollart Bay. It is nearly circular in form, surrounded by walls and a fosse, and traversed by canals crossed by 18 bridges. The Hunse is here converted into a canal, navigable for large vessels, about 600 of which visit the town annually. The great marketplace is 662 ft. long and 389 ft. broad, and contains the beautiful Gothic church of St. Martin's, with a noble tower 343 ft. high. The university founded 1614, has a library, botanic garden, and cabinet of natural history. G. has railway communication with Friesland, Germany, and southward to all the Netherlands towns. The port of G. is good; it communicates by canals with Dollart Bay on the e., with the Lauwer Sea on the n.w., and with the en-

GRONOVIVS—GROOVE.

trance to the Zuider Zee at Harlingen on the west. There are ship-building yards and paper-mills. Pop. (1879) 46,058; (1889) 54,332; (1890) 56,413; (1901) 68,440.

GRONOVIVS, *gro-no'vî-ûs*, or GRONOV, *gro'nòv*: family of classical scholars of German extraction, settled in Holland.—The most famous are JOHANN FRIEDRICH G. (1611–71), b. Hamburg, prof. at Leyden 1659. He published editions of many of the classical authors.—His son, JACOB G. (1645–1716) also prof. at Leyden, likewise edited classics, and left a *Thesaurus Antiquitatum Græcarum*. Two sons of Jacob G. and a grandson were distinguished scholars.

GROOM, n. *grôm* [Dut. *grom*, a youth; *grome*, a lover: OF. *gromme*, a servant: Goth. *guma*; Icel. *gumi*; OE. *gome*, a man—*lit.*, a lad or servant in waiting]: a man or boy who has the charge of horses; a man about to be married or who has been recently married—more usually called a *bridegroom*: V. to tend and clean, as a horse. GROOMING, imp.: N. the care and feeding of horses. GROOMED, pp. *grômd*. GROOM'S-MAN, an attendant of a bridegroom at his wedding—familiarily called *best man*: see BRIDE. GROOM IN WAITING, GROOM OF THE CHAMBER, certain officers of the English royal household. GROOM OF THE STOLE: see STOLE 1.

GROOT, *grôt*, GERHARD; or GERHARD THE GREAT (other forms GROOTE or GROET or GROETE, *Gerrit* or *Geert*): 1340, Oct.—1384, Aug. 20; b. Deventer, Holland: founder of the Soc. of Brethren of the Common Life. He studied at Deventer, Aix-la-Chapelle, and Cologne, and graduated at the Univ. of Paris 1358 with high honors in theology, philosophy, law, medicine, and astrology. He then taught theology and philosophy in Cologne, obtained several rich benefices though not in holy orders, visited the papal court at Avignon, was lauded wherever known for his profound learning, and began living in a state of great luxury. In 1374 he was convinced of the vanity of his life, renounced all worldly enjoyments, resigned his benefices, spent 3 years in study and prayer in the Munnikhuizen monastery, was ordained deacon, and became a missionary preacher within the diocese of Utrecht. He translated the Psalms and the Dutch office into Dutch, established the soc. of 'Brethren and Clerks of the Common Life' for transcribing mss. copies of the Bible and the writings of the fathers, and obtained for it the pope's sanction 1376. The first monastery was built 1386 and by 1460 there were 150. The soc. was dissolved at the time of the Reformation.

GROOTE EYLANDT, *grô't-h î'lânt* (English, *Great Island*): off the w. coast of the Gulf of Carpentaria, N. Australia; largest island in that vast inlet, lat. 14° s., long. 136° 40' e. Its extreme length and breadth are about 40 m. each. The centre is mountainous, and the shores are dry and barren.

GROOVE, n. *grôv* [Dut. *groeve*, a furrow: Ger. *grube*, a pit—from *graben*, to dig]: a furrow; a channel or long

GROPE—GROSBEAK.

hollow cut by a tool: V. to furrow; to cut a channel with an edged tool. GROOVING, imp. GROOVED, pp. *grôvd*.

GROPE, v. *grôp* [Sw. *grabba*; Icel. *grípa*, to gripe, to grasp: Pol. *grabie*, to seize, to rake: connected with GRAB and GRASP]: to feel one's way, as with the hands, or as a blind man; to search or attempt to find, as in the dark. GRO'PING, imp. GROPED, pp. *grôpt*. GRO'PER, n. one who. GRO'PINGLY, ad. -*ly*.

GROS, *grô*, ANTOINE JEAN, Baron: 1771, Mar. 16—1835, June; b. Paris: French historical painter. He studied in the school of David, and acquired celebrity by his picture of Bonaparte as the Victor of Arcola. Bonaparte was so much pleased with the work, that he appointed G. a member of the commission to collect the objects of art which had been ceded to France by the treaty of Tolentino. G.'s first great achievement, however, was the *Pestiférés de Jaffa* (The Plague-smitten at Jaffa), executed at Versailles 1804. It excited prodigious enthusiasm, the author being carried in triumph to the saloon of the Louvre, where the picture was crowned in his presence. Other important works by G. during the consulate and the empire are: *Bonaparte aux Pyramides*. *Le Combat d'Aboukir*, *La Bataille de Wagram*, *Charles-Quint reçu à Saint-Denis par François Ier*. After the return of the Bourbons, G. painted among other pictures, *Le Départ Nocturne de Louis XVIII., au 20 Mars 1815*, *La Duchesse d'Angoulême s'embarquant à Pauillac*, and *Charles X. au Camp de Reims*. He finished 1824, an immense work for the cupola of the church of St. Geneviève in Paris, begun 1811, to which, say his countrymen, 'there is nothing comparable.' It is not a fresco, but a painting in oil on a peculiar kind of plaster, representing the four great dynasties of France doing homage to the tutelary genius of the nation. Charles X. was so charmed with the work, that he raised G. to the dignity of a baron, and doubled the sum which the painter had originally stipulated for. The rise of the romantic school bore away from him the tide of popularity: and G. felt the ebbing of his fame acutely, and took refuge in dissipation, and, it is suspected, committed suicide in a fit of profound chagrin. At all events his body was drawn out of the Seine near Meudon, 1835, June 25. G.'s paintings all are marked by strength of effect, and dramatic movement in the scene; they are, however, deficient in delicacy and sentiment, and exhibit only ordinary imagination.

GROSBEAK, or GROSSBEAK, n. *grôs'bêk* (Fr. *grosbec*, large beak], (*Coccothraustes*): genus of birds of the family of *Fringillidæ*, distinguished chiefly by the great thickness of the bill, which has also a proportionate strength, and notwithstanding the small size of the birds, is used for breaking the stones of cherries, olives, etc. The hawfinch (q.v.) and greenfinch (q.v.) are the European species; but some are found in other parts of the world, as the beautiful EVENING G. (*F. vespertina*) and the ROSE-BREASTED G. (*F. Ludovician*) in N. America.—For some allied species usually

GROSCHEN—GROSS.

assigned to the family of finches (see FINCH) or *Fringillia*: see CARDINAL BIRD: PINE FINCH: also WEAVER-BIRD.



Grosbeak (*Loxia coccythraustes*).

GROSCHEN, n. *grōsh'n*: a small silver coin of Germany, worth about two cents.

GROSE, *grōs*, FRANCIS: 1731–1791, June 12; b. Greenford, England: antiquary. He received an excellent education, became a proficient draughtsman, and for a time was employed in the Herald's College. In 1757 he was elected a fellow of the Soc. of Antiquaries, 1773–87 published his *Views of Antiquities in England and Wales*, 1789 made an antiquarian tour of Scotland, 1790 began publishing the results of this tour, and 1791 had started on a similar tour of Ireland, when he died suddenly of apoplexy in Dublin.

GROS-EM, n.: silver coin, used in Switzerland, of the value of about one dollar and fifteen cents.

GROSS, a. *grōs* [F. *gros*—from mid. L. *grossus*, thick—from L. *crassus*, thick: comp. Gael. *graosda*, filthy, obscene]: thick; fat; corpulent; coarse; rude; indelicate; impure; unrefined; great, as gross ignorance; whole or entire: N. the whole taken together; the whole weight of goods, including box, package, or such-like; the mass. **GROSS'LY**, ad. *-lī*, in a gross manner; coarsely; shamefully; palpably. **GROSS'NESS**, n. coarseness; thickness; greatness; unwieldy corpulence; want of refinement or delicacy. **GROS'SIFICA'TION**, n. *-sī-fī-kā'shūn* [L. *faciō*, I make]: in bot., the process of swelling in the ovary after fertilization. **GROSS AVERAGE**, the average upon the gross or entire amount. **BY THE GROSS**, by the whole weight or bulk. **IN THE GROSS**, in the bulk; with all parts taken together.—**SYN.** of 'gross, a.': large; aggregate; bulky; rough; stupid; vulgar; low; obscene; dense; palpable; whole; total; entire; shameful; unseemly; enormous; heavy; oppressive.

GROSS, n. *grōs* [F. *grosse*—from *gros*, large]: the number of twelve dozen. **GREAT GROSS**, 12 gross.

GROSS—GROSSETESTE.

GROSS, *grōs*, SAMUEL DAVID, M.D., LL.D., D.C.L.: 1805, July 8—1884, May 6; b. near Easton, Penn.: surgeon. He graduated at the Jefferson Medical College 1828, began practicing in Philadelphia, removed to Easton 1829, became demonstrator of anatomy in the Univ. of Cincinnati 1833 and prof. of pathological anatomy there 1835, prof. of surgery in the Univ. of Louisville, Ky., 1840; successor to Prof. Valentine Mott in the Univ. of Vt. 1850 and of Prof. Thomas Dent Mütter in Jefferson Medical College 1856 and held the latter office till 1882. He was a founder and the first pres. of the Philadelphia Pathological Soc., was elected a member of the Royal Medical Soc. of Vienna 1862, pres. of the American Medical Assoc. 1867, member of the Royal Medico Chirurgical Soc. of London and the British Medical Assoc. 1868, and pres. of the International Medical Congress at Philadelphia 1876. He received the degree LL.D. from the Univ. of Cambridge and of D.C.L. from the Univ. of Oxford 1872. His published works include *Diseases and Injuries of the Bones and Joints* (1830), *Elements of Pathological Anatomy*, 2 vols. (1839–57) *Wounds of the Intestines* (1843), *Diseases, Injuries, and Malformations of the Urinary Organs* (1851, 1855, 76), *Results of Surgical Operations in Malignant Diseases* (1853), *Foreign Bodies in the Air Passages* (1854), *System of Surgery*, 2 vols. (1859; 6th ed, 82), *Manual of Military Surgery* (1861) *History of American Medical Literature* (1875) and *Century of American Medicine* (1876).

GROSSART, n. *grōs'ert* [OF. *groiselle*; F. *groseille*—from Sp. *grosella*, the fruit of the currant: O.H.G. *kraüsselbeere*: Gael. *groiseid*, a grossart]: in many districts, a familiar name for a gooseberry. **GROSSULAR**, n. *grōs ū-lēr*, or **GROSSULAIRE**, n. *-lēr*, the name given to the pale gooseberry-green varieties of translucent lime alumina garnet.

GROSS-DE-NAPLES, *grō-dě-náp'l* [F. *gros*, thick, stout; *de*, of; *Naples*, the town]: a silk fabric like lute-string, but not so stout, made both plain and figured.

GROSSENHAIN, *grōs'sēn-hīn*, or **HAIN**, *hīn* (formerly *Markgrafenhain*): small manufacturing town of Saxony, on the left bank of the Röder, 20 m. n.w. of Dresden; noted for woolen and cotton manufactures. Pop. (1880) 11,933.

GROSSETESTE, *grōs'tĕst*, ROBERT: celebrated English prelate of the middle ages: abt. 1175–1253, Oct. 9; b. Stradbroke, in Suffolk. He studied at Oxford, and at Paris. On his return to England, he obtained a great reputation as a divine, and was the first lecturer in the Franciscan school at Oxford. In 1235, he was elected Bp. of Lincoln, and at once commenced a vigorous reformation of abuses in his diocese. The most conspicuous and offensive ecclesiastical sin in G.'s days was the conduct of the pope (Innocent IV.) in church appointments. It was common for his holiness to make grants of vacant benefices in England to Italians, and other foreigners, many of whom, it would appear, never showed face in England, but contented themselves with drawing the revenues of their office.

GROSSETO.

Against this G. set himself strongly, incurring, by his boldness, a temporary suspension from his episcopal functions, and a continual menace of excommunication. One of these transactions in 1253 has been the subject of much controversy. It is alleged by some writers that Innocent wrote to G., ordering his nephew, an Italian youth, to be promoted to the canonry first vacant in the cathedral of Lincoln, accompanying his injunctions with threats. The bishop was filled with indignation, and addressed a letter either to the pope or his agents, in which he declares, that 'if an angel from heaven commanded him to obey a mandate so absurd and sinful, he would not do it,' and compares the nepotism of the pope to the sin of Lucifer and Anti-Christ. Innocent, according to these writers, was violently enraged at his opposition; he excommunicated G., and even appointed a successor to the bishopric, but in this instance the thunder of the Vatican was harmless. G. quietly appealed to the tribunal of Christ, and troubling himself no more about the matter, continued to discharge his episcopal functions. The general feeling of the English nation sustained him; the clergy of his diocese went on obeying him as if nothing had happened; and at his death Abp. Boniface conducted the funeral services. But Dr. Lingard (II. 502) has shown that the mandate came not from the pope, but from the nuncio; that Innocent, on receiving G.'s reply, not only rescinded the order, but adopted measures for the reform of these abusive appointments; and that the story of his having died under a sentence of excommunication rests on very questionable authority. G. has often been regarded as one of the 'reformers before the Reformation.' It is assumed that because he quarrelled with the head of the church on a matter of discipline, he must have been a 'Protestant.' But nothing could be further from the fact than this assumption. He belonged to that class of minds who look at truth not from the side of *doctrine*, but of *practice*. He would have accepted, with acquiescence, any new doctrine from the Vatican, but a knavish trick was not to be endured, even at the hands of an angel from heaven! It is futile, therefore, to claim him as a precursor of men like Luther, of Calvin, or Knox. In politics, he was a constitutionalist, and a friend of Simon de Montfort, heartily interested in the preservation and extension of such liberty as England then enjoyed. His learning was prodigious, almost inspiring awe among his contemporaries. Latin, Greek, Hebrew, French, mathematics, medicine, and music were among his attainments. His knowledge of the Scriptures also is particularly lauded. G. was one of the most voluminous authors that England ever produced. The list of his works, given by Dr. Pegge, of which only a few have been published, occupies 25 closely-printed pages in quarto. For an intelligent estimate of his life and character see Brewer's *Monumenta Franciscana*, and the collection of his letters edited by Luard (1862), *Roberti Grossesteste Episcopi quondam Lincolnensis Epistolæ*.

GROSSETO, grōs-sē'tō: province of central Italy, on the Mediterranean; 1,712 sq. m.: largely mountainous and

GROSSETO—GROSVENOR GALLERY.

marshy. There is little cultivable soil. Timber and coal are among the chief products. Principal town, Grosseto.—Pop. of province (1901) 144,722.

GROSSETO: town of central Italy, cap. of the *Mar-emma* (q.v.), and of the province called Grosseto; on the *Ombrone*, about 10 m. from its mouth. The town is very unhealthy, but well-built and fortified. It has a fine cathedral, two convents, and a hospital; and is the seat of a bishop. Pop. (1901) 9,599.

GROSS-GLOGAU: see **GLOGAU**.

GROSSIFICATION, n.: see under **GROSS** 1.

GROSSULAR, etc.: see under **GROSSART**.

GROSSULARIACEÆ, *grôs-û-lâ-rî-â'sê-ê*: natural order of exogenous plants, containing about 100 known species, all shrubs, natives of temperate climates, and chiefly of the n. hemisphere. They have alternate lobed leaves. The calyx is 4—5 cleft, the tube entirely or in part adherent to the ovary; the petals are very small, alternate with the segments of the calyx; the stamens are alternate with the petals, and inserted into the throat of the calyx; the ovary is one-celled, with two opposite parietal placentæ; the fruit is a berry crowned with the remains of the flower, having numerous seeds immersed in pulp, and suspended by long threads; the *testa* externally gelatinous, adhering firmly to the horny albumen. The most important species of the order are the gooseberry (q.v.) and currants (q.v.).

GROSSWARDEIN, *grôs-vâr'dîn* [*Magyar, Nagy-Varad*]: free city, cap. of the co. of Bihar, Upper Hungary; in a beautiful plain, on the *Sabes Körös* ('the rapid Körös'), 38 m. s.s.e. of Debreczin. It is the seat of a Rom. Cath. bishop, and of a non-united Greek bishop, and consists of the town of G. proper, and eight suburbs. The town is surrounded by a wall, and was formerly a fortress. The principal buildings are the churches, of which there are 22, including the magnificent cathedral.

There is great trade, especially in pottery, in cattle-rearing, and in the cultivation of the vine. There are several distilleries. The town is connected by railway with Vienna. G. was taken and pillaged by the Turks 1660, and by the Austrians 1692. Pop. (1880) 31,324; (1900) 50,177.

GROSVENOR GALLERY, *grô'ven-ér*: building erected erected by Sir Coutts Lindsay on Bond street, London, at a cost of \$600,000, for the exhibition of paintings and sculpture; opened to the public 1877, May 1. Sir Coutts had lived many years in Rome and studied art with Gibson and Ary Scheffer, and had subsequently designed and decorated several notable halls in London. In this work he saw the superior advantage of having paintings and statuary exposed amid more home-like surroundings than the Royal Acad. afforded, and built, decorated, and furnished the G. G. in harmony with this idea. His Italian art education led him to adopt the Renaissance style of that country. The façade is of stone; the doorway—the work of Palladio—formerly belonged to the Church of Santa

GROS VENTRES—GROTE.

Lucia, Venice; and the principal gallery is 104 ft. long, 35 ft. wide, 36 ft. high. His provision of decorated walls and artistic furniture allows the contributions of painters and sculptors to be more scattered and harmoniously arranged than in the crowded halls of the Royal Acad., and no one work of art is subordinated by the pose, color, tone, or sentiment of its neighbor. Another of his innovations was the disregard of the Acad. rule that contributions should be selected by a committee of artists and laymen. Instead of this artists are invited to contribute, and the number and character of their contributions are left to their own judgment.

GROS VENTRES, *grō vēnt'r* [Fr. Big Bellies]: name of two distinct tribes of American Indians: 1, the G. V. of the Mo., or Minnetaries, or Hidatsa, formerly a branch of the Crows, latterly living with the Mandans, and great enemies of the Sioux; since 1870 dwelling on the reservation on the frontier of Montana; 2, the G. V. of the prairies, part of the Arrapahoe family, living in amity with the Black-foot tribe on a reservation of 17,000,000 acres in Montana between the Mo. and Milk rivers; number (1834) reported 1,800.

GROT, n. *grôt*, or GROTTO, n. *grôt'tō* [F. *grotte*; It. *grotta*, a cave, a den—from mid. L. *crypta* and *grupta*—from L. *crypta*, a vault]: a cave; a cool recess or excavation; a summer-house in a garden of a particular form and ornamented, as with shells, etc. GROTTOS, plu. -tōz.

GROTE, *grôt*, GEORGE, D.C.L., LL.D.: historian of Greece, also statesman and philosopher: 1794, Nov. 17—1871, June 18; b. Clay Hill, Beckenham, Kent, England, His grandfather, Andrew G., native of Bremen, settled in London as a banker in the beginning of the 8th c. His mother was daughter of the Rev. Dr. Peckwell, chaplain to the Countess of Huntingdon; and her mother was an Irish lady, descended from a Prot. member of an old French family in Touraine. G. was educated at Charter-House, and at the age of 16 entered his father's banking-house, employing all his leisure in study. In 1823, he began to amass materials for a history of Greece. Previous to 1832, he wrote on parliamentary reform, and threw himself into the agitation for the Reform Bill. After the passing of the bill he was elected, at the top of the poll, a representative of the city of London in parliament, and continued a member of the house of commons till 1841. His parliamentary career was distinguished chiefly by his annual motion for the ballot, but he spoke with great effect on many other questions. In 1843, he retired from the banking house, and applied himself to his history; the first two vols. appeared 1846, and the last (12 in all) 1856. He forthwith commenced the study of Greek philosophy, and in 1865 brought out his work on Plato. The remainder of his studious life was devoted to Aristotle, but he executed only a part of what he intended. After his death, appeared what he had composed on Aristotle; also a collection of essays, entitled *Minor Works*; and, 1876, *Fragments on Ethical Subjects*. *The*

GROTEFEND—GROTESQUE.

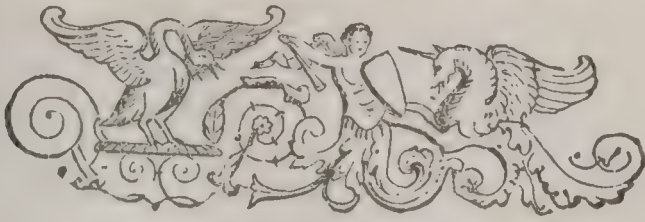
Personal Life of George Grote was written by Mrs. Grote, who wrote also other works. She was remarkable for personal beauty, and for intellectual powers and social gifts of unusually high order: she was her husband's constant companion in study. She survived him more than seven years. G. spent much of his time, in later years, in the management of the great unsectarian educational institutions—University College and the Univ. of London—being at the time of his death pres. of one, and vice-chancellor of the other. His whole career was marked by attachment to liberal opinions. He was not merely a scholar of erudite research; he applied himself also to mental philosophy and logic, by which he became as much distinguished in his capacity of historian of philosophy as in political history.

GROTEFEND, *grō'tēh-fēnt*, GEORGE FRIEDRICH: 1775, June 9—1853, Dec. 15; b. Münden, Hanover: philologist. He was educated in Münden, Ilfeld, and the Univ. of Göttingen, became asst. master of the gymnasium there 1797, published his first work *De Pasiographia sive Scriptura Universali* 1799, and was soon afterward appointed rector of the Frankfort gymnasium. In 1815 he published *Anfangsgründe der deutschen Poesie*; 1817, founded a soc. for investigating the German language; 1821 was appointed director of the Hanover gymnasium; 1823-4 published his revised edition of Wenck's Latin grammar, 2 vols., 1835-38 *Rudimenta Linguae Umbricae ex Inscriptionibus antiquis enodata*, 8 parts, 1839 *Rudimenta Linguae Oscae*, and 1840-42 *Zur Geographie und Geschichte von Altitalien*, 5 parts. He also contributed largely to Ersch and Gruber's cyclopaedia. Original and important as were his investigations of the Latin, Italian, and German tongues, what is considered the greatest achievement of his life were his patient and successful efforts to discover the key for deciphering the cruciform inscriptions. He took up the study of the Persian inscriptions prior to 1800 and in that year communicated his first discovery to the Royal Soc. of Göttingen. In 1815 he elaborated it in Heeren's work on ancient history, 1837 published his *Neue Beiträge zur Erläuterung der persepolytischen Keilschrift*, and 1840 *Neue Beiträge zur Erläuterung der babylonischen Keilschrift*. He demonstrated that the Persian inscriptions contained three forms of writings, that the characters were alphabetic not syllabic, that they should be read from left to right, and that the alphabet contained 40 letters, including signs for long and short vowels. The results of his discovery were subsequently wrought out by Burnouf, Lassen, and Rawlinson.

GROTESQUE, a. and n. *grō-těsk'* [F. *grotesque*, odd—from *grotte*, a grotto: It. *grottesco*]: *literally*, the style in which grottoes or vaults were ornamented. So named in the 13th c., when rediscovered in the excavations in the baths of Titus and other ancient Roman buildings. This light, fantastic style was much in favor during the Renaissance. It abounds in all kinds of transformations, from the animal to the vegetable, and mingles all the natural kingdoms in fanciful and picturesque confusion. The

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name *grotesque* thus came by degrees to mean a fanciful combination of natural ideas as applied to ornament. Thus, all the animal and vegetable *inventions* of the mediæval artists are grotesques. Some of these are very beauti-



Grotesque.

ful, and other very picturesque; and, generally, an idea of some value, such as boldness, fierceness, dignity, etc., is expressed. In this mode of application, the grotesque is a valuable quality in art; it is when it becomes debased, as in the monstrosities of the Renaissance, that it becomes extravagant, whimsical, ludicrous—with which meaning it is commonly used. GROTESQUE'LY, ad. -li. GROTESQUE'NESS, n.

GROTIUS, *grō'shī-ŭs*, HUGO (Dutch, *Huig van Groot*): 1583, Apr. 10—1645, Aug. 29; b. Delft; son of Jan de G., burgomaster of the town and curator of the Univ. of Leyden. In his 11th year G. entered the Univ. of Leyden, where he studied under Joseph Scaliger. He was a prodigy of precocious genius. In his 15th year he took his degree. In the following year he accompanied Olden Barneveldt, the grand pensionary, on his embassy to France, where, notwithstanding his extreme youth, he gained the favor of Henry IV. On his return, he began to practice as a lawyer; and 1607 was appointed fiscal-gen. and 1613 council-pensionary at Rotterdam. But the disputes between the Remonstrants (see ARMINIUS) and their opponents were now at their height in Holland; Olden Barneveldt had the misfortune to be the protector of the former, and G. also supported them by his writings and favor. These religious, or rather theological strifes had a *political* significance also; the consequence was, that both Olden Barneveldt and G. were arrested, tried, and condemned by the dominant party under Prince Maurice (see BARNEVELDT). Olden Barneveldt was beheaded 1619, and G. sentenced to imprisonment for life in the castle of Lovenstein. He escaped, however, by the contrivance of his wife, who managed to have him carried out of the castle in a chest used for the conveyance of books and linen, while she remained in prison in his stead. Her devotion impressed even his stern masters, and she was set at liberty.

For some time, G. wandered about in the Rom. Cath. portion of the Netherlands, and finally escaped to France, where Louis XIII. bestowed on him a pension of 3,000 livres; but not paying sufficient court to Richelieu, he lost the king's favor, and 1631 his pension was withdrawn. A friendly letter from Prince Frederick of Orange induced him to return to his native country; but by the intrigues of his enemies, sentence of perpetual exile was soon passed

upon him. He removed to Hamburg, and, while there, received invitations from the kings of Denmark, Poland, and Spain; but the protection promised him by the Chancellor Oxenstiern, and Queen Christina's taste for literature, induced him to enter the Swedish service 1634. As ambassador at the French court (1635-45), he gained universal respect. On his return to Sweden, he passed through his native country, and was received in Amsterdam with most distinguished honor. Equally flattering was his reception by the Swedish queen; but the literary dilettantism of Christina's court did not suit so serious and solid a scholar, whose thoughts were always of the broadest and most forecasting nature. Besides, the climate of Sweden did not agree with him, and he was probably longing to spend the evening of his life in his native land. In consequence, he sent in his resignation of office to the queen, who, when she found that nothing could induce him to stay, presented him with a sum of 10,000 crowns and some costly plate, besides placing at his disposal a vessel to conduct him down the Baltic to Lübeck. A storm compelled him to land on the coast of Pomerania. While proceeding toward Lübeck, he was seized with a fatal illness, and died at Rostock.

To the talents of a most able statesman, G. united deep and extensive learning. He was a profound and enlightened theologian—perhaps the best scriptural exegete of his day, a distinguished scholar, an acute philosopher, a judicious historian, and a splendid jurist. Altogether, he was what Ménage called him, 'a monster of erudition.' His metrical translations from the Greek authors reveal superior poetical powers; he was one of the best modern writers of Latin verse, and likewise composed poems in the Dutch language. In spite of his broken, wandering, and checkered career, G. found time to write a great variety of works. The first was the *Mare Liberum*, in which he defended the freedom of the Dutch E. India trade. His chief work, however, is that entitled *De Jure Belli et Pacis*, translated into all the languages of Europe. It may be considered the basis of international law, and has long been a text-book in many universities. Among his other works are: *Annales et Historiæ de Rebus Belgicis* (Amsterdam 1657), written in a style that equals Tacitus for concise and pointed power; *Annotiones in Vetus Testamentum* (Paris 1644); *Annotiones in Novum Testamentum* (Paris 1644); *De Satisfactione Christi*; *De Veritate Religionis Christianæ* (Leyden 1627), translated even into several Oriental languages, and remarkable for its clear arrangement, vigorous logic, and eloquent style. It is reckoned one of the best 'apologies' for Christianity in modern times. G., though a deep student of theology, was not strongly drawn to merely dogmatic propositions for their own sake. His mind was comprehensive, his nature tolerant, and his thought was to seek some scheme of mutual compromise and accommodation between the Calvinistic and Arminian parties. To this also he was moved by his profound sentiment of Christian piety. But even had the Remonstrants been ready for such a course, the Calvinists of his land and

GROTON—GROUCHY.

times counted toleration in matters of doctrine a deadly sin.—Compare Butler, *Life of Grotius* (London 1826); De Vries, *Huig de Groot* (1827); Creuzer, *Luther und Grotius* (1846); works by Hartenstein (1850) and Caumont (1862); and Hély, *Étude sur Grotius* (1875).

GROTON, *graw'ton*: village and tp. in New London co., Conn.; on the Thames river and the Boston and Providence railroad, opposite New London; bounded s. by Long Island Sound. It is drained by the Mystic and Pequonnock rivers which afford valuable water power for manufacturing, and contains the villages of G. and Noank, several cotton-mills, brass and iron foundries, britannia ware and carriage factories, two granite quarries, and a handsome monument to the memory of the garrison of Fort Griswold (on the site of G.), who were massacred by the British troops after surrender 1781. Pop. (1900) 5,962.

GROTON: town, Middlesex co., Mass.; on the B. & M. rr., 14 m. w. of Lowell. Has an acad., public library, and two weekly papers. A portion was incorporated 1870 as the town of Ayer. Pop. (1900) 2,052.

GROTTA DEL CANE, *grôt'tá cĕl kâ'nâ* (*Grotto of the Dog*): noted cave near Naples, in the vicinity of Lake Agnano and of Puzzuoli. It is about 10 ft. long, 4 ft. wide, and 9 ft. high, and is so full of carbonic acid gas, especially near the floor, that little animals introduced into it soon die, and tapers placed near the ground are extinguished. This cave was known to the ancients, and is described by Pliny. It derives its name from the practice of introducing small dogs, which are soon almost deprived of life by the gas, but recover when restored to the open air.

GROTTAGLIE, *grôt-tâl'yâ*: town in s. Italy, province of Lecce; dating from the 10th c.; named from the *grotte* (caves) in the hill which rises near it. Pop. 9,000.

GROTTE, *grôt'tâ*: town of Sicily, province of Girgenti; 13 m. n.n.e. of the town of Girgenti; named from the number of caves in the rocks around. Pop. 9,000.

GROTTO: see **GROT**.

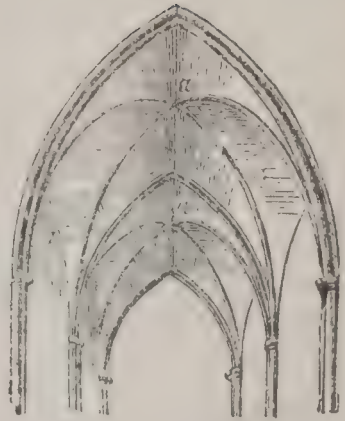
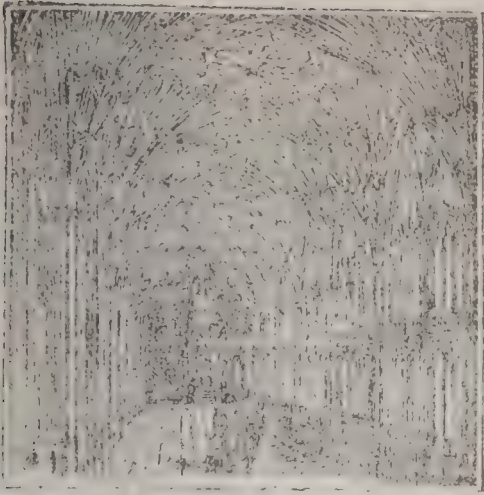
GROUCHY, *grô-she'*, **EMMANUEL**, Marquis **DE**: 1766, Oct. 23—1847, May 29; b. Paris: general. He entered the French army 1781, was a lieut. in the royal body guard 1787-93, served with Lafayette, was promoted brig.gen., commanded the cav. in the army of the Alps, aided in the conquest of Savoy, and after fighting in La Vendée 1794 was cashiered with all other officers of the nobility. He then enlisted as a private soldier, and after the fall of Robespierre was reinstated and promoted gen. of div. by a special decree. In 1798 he persuaded the king of Sardinia to abdicate and surrender Piedmont to France; 1799 received 14 wounds and was taken prisoner at Novi; gained his liberty after Marengo, served with Moreau on the Rhine, and was promoted inspector gen. of cav.; defeated the Prussian cav. at Zehdenik 1806, Oct. 26; was gov. of Madrid 1808, took part in the battle of Wagram 1809, distinguished himself at Borodino 1812, and commanded

GROUE—GROUND.

the emperor's body-guard on the retreat from Moscow. On the restoration of the Bourbons he was banished from France, but a year later (1815) was permitted to return; and when Napoleon reappeared from Elba, G. was given a command and made a marshal of France for his successes in the north. He then marched into Belgium, defeated the allied English and Prussian armies at Fleurus and Ligny June 16; and by following Napoleon's orders to the letter to pursue Blücher is believed to have caused the French defeat at Waterloo, when, had he followed the advice of his generals, he might at a critical moment, by joining Napoleon, have effected the defeat of the allies. He was again banished by the Bourbons, lived 5 years in Philadelphia, was recalled to France 1821, and after the revolution of 1830 was restored to rank as marshal and created a peer.

GROUE, v.: see GRUE.

GROUND, n. *ground* [Goth. *grundus*; Dut. *grond*; Icel. *grunnr*; Pol. *grunt*; Ger. *grund*; Gael. *grunnd*, ground]: the earth or soil, as distinguished from air or water; the surface or upper part of the earth; soil; territory or region; estate or possession; that which supports anything; fundamental cause; place of any contest; primary reason; in a *painting*, the primary or principal color (see below); fundamental substance: in *OE.*, a tune or plain song; foil: V. to lay or place on the ground; to settle in first principles; to fasten or strike on the bottom, as a ship in too shallow water. GROUNDING, imp. GROUND'ED, pp. fixed on the ground, as a ship; thoroughly instructed. GROUND'AGE, n. *-ij*, toll for lying in port. GROUND'EDLY, ad. *-li*, upon good grounds. GROUND'LESS, a. without foundation; false. GROUND'LESSLY, ad. *-li*, without just cause or reason. GROUND'LESSNESS, n. want of just cause or reason. GROUND'LING, a fish that keeps at the bottom of the water (see below): a spectator in the pit of a theatre. GROUNDS, n. plu. *groundz* [Gael *grunndas*, lees, dregs—from *grunnd*, ground]: dregs or lees; in *arch.*, pieces of wood let in flush with the plastering, for which they serve as a guide, and to which the moldings and other finishings are nailed. GROUND-BAIT, bait thrown into the water to assemble fish. GROUND-FLOOR, the lowest floor of a house on a level with the outside ground. GROUND-GAME, wild animals such as hares and rabbits, as distinguished from winged-game. GROUND-ICE, or ANCHOR ICE, ice formed under peculiar circumstances at the bottom of running or shallow water; often found in the Baltic Sea. GROUND-NUT, a seed—the pea-nut or American earth-nut. of nat. ord. *Leguminosæ* (see ARACHIS): also a tuber—the pig-nut or earth-chestnut (see EARTH-NUT). GROUND-PLAN, the plan of the lowest or bottom flat of a house. GROUND-PLATE, in *arch.*, the piece of timber which forms the lower part of a timber building. GROUND-PLOT, ground on which a building is placed. GROUND-SIL, n. *-sil*, or *-SEL*, *-sël* [AS. *sil*, threshold]: the timber of a building which lies next to the ground. GROUND-SWELL, the heavy swelling and surging of the sea



a, a, Groins.

Groined Vaulting.—Cloisters of Gloucester Cathedral: Fan-tracery Vaulting.



Gromet for a Sail.

Grot.—Grotto of Melidhoni in Crete.



Ground-nut (*Arachis hypogaea*).

GROUND DOVE AND GROUND PIGEON.

after a storm, or as indicating an advancing storm. GROUND-TACKLE, in a *ship*, all the ropes, etc., connected with the anchors and other mooring apparatus. GROUND-WORK, the foundation or basis of anything; first principles; fundamentals. TO FALL TO THE GROUND, to come to nothing; to be quite unsuccessful. TO GAIN GROUND, to advance; to have some success. TO LOSE GROUND, to give way; to go back; to retire.—SYN. of 'ground, n.': dust; earth; estate; land; field; possession; foundation; bottom; basis; premise; reason; datum; surface; floor; soil.

GROUND, in Painting: coating or preparation put on the surface of the panel, board, or canvas on which a picture is to be painted. Artists attach great importance to the color and texture of the G., as largely effecting the technical quality of the work. In forming an opinion on paintings attributed to old masters, the kind of G. used is always taken into consideration, for in different epochs and schools, particular grounds were used. The works of the Italian school preceding and during the time of Raphael all were painted on white grounds, and almost always on panels, even when the works were large, and many pieces had to be joined. The preparation was composed of *gesso*, plaster of Paris, or chalk mixed with size, and the G. was of course absorbent. Afterward, when canvas came to be generally used, the works of the Italian and Spanish schools generally were painted on an oil G. of dull red color; and when this was not covered by the artist with a thick *impasto* or body of paint, the picture was apt to become black and heavy, a fault very marked in the works of the school of the Carracci and of the Neapolitan and later Roman schools. The works of the Dutch and Flemish masters, which are distinguished for brilliancy and transparency, were painted on light grounds, varying from white to gray, and their practice is generally followed in modern schools.—The term *ground* is applied also to different parts of a picture as the *foreground*, or portion of the picture on which are placed the figures or objects represented as nearest the spectator; *background*, the part, particularly in portraits, behind or on which it is intended to set off or relieve the head, figure, or group depicted.—The portion of a model or carving from which the figures are projected, also is styled the ground.

GROUND-ANNUAL, in the Law of Scotland: annual rent or annuity paid by the owner of land to a creditor or to the vendor of the land; in most respects corresponding to ground-rent (q.v.), though the parties stand in a converse relation. It also resembles a rent-charge (see RENT) with a like distinction.

GROUND DOVE AND GROUND PIGEON: those birds of the family *Columbidæ* which in characters and habits approach most to the ordinary gallinaceous type. They have short and rounded wings, with much inferior power of flight to pigeons in general; their legs are longer, and their feet adapted rather for walking than for grasping. They are little arboreal in their habits, but live

GROUND HOG—GROUND RENT.

mostly on the ground. Many of them run very quickly. They have not in general much brilliancy of plumage, but among them are the beautiful Bronze-wings (q.v.) of Australia.

GROUND' HOG: see WOODCHUCK.

GROUND-IVY (*Glechôma hederacea*, united with the genus *Népeta* by some botanists as *N. Glechoma*): plant of nat. ord. *Labiata*, growing in waste places, plantations, hedges, etc., in a dry soil. It has a creeping stem, kidney-shaped crenate leaves, and axillary blue flowers growing in threes. The flowers have four ascending stamens, two long and two short, a 15-nerved 5-toothed and equal calyx, the anthers before bursting approaching in pairs and forming a cross. A tea prepared from the leaves is in great repute among the poor in many places, and the plant is stimulant, aromatic, and of use in pectoral complaints. The leaves were formerly used in England for clarifying and flavoring ale, which was then called Gill-ale or Gell-ale, from Gill or Gell, an old name of this plant (which was called also alehoof or tunhoof), but this use has been discontinued since the introduction of hops.

GROUND-LAU'REL, or MAY'FLOWER: see *Epigæa Repens*.

GROUND'LING (*Botia tænia*): small fish of the family *Cyprinidæ*, found in some of the rivers of England. It is never more than three or four inches long. It habitually keeps close to the bottom. It is probably often mistaken for the Loach (q.v.), which it much resembles; but, besides its smaller size, it is of a much more compressed form, and is distinguished particularly by a forked spine beneath each eye. These have been made generic distinctions. Several species having these characters are found in the Ganges.

GROUND'-PINE: popular name of the *Ajuga chamæpitys*, which is not of the pine but the mint order, and called pine from its resinous smell; also of the *Lycopodium clavatum*, an evergreen vine sometimes reaching a length of 3 yards, and called sometimes mare's tail; also of a third species known as club moss, a beautiful tree-like plant usually reaching a height of 8 inches.

GROUND'RENT, in Law: rent which a person, who intends to build on a piece of ground, pays to the landlord for the use of the ground for a certain specified term, usually 99 years. The usual arrangement between the owner of the freehold of land and a speculating builder, is of this kind. The builder pays a certain annual sum by way of rent to the owner who is thereafter called the ground-landlord, and then commences to build upon the land. The builder then lets the houses and in doing so he of course includes in the rent which he puts on each house a proportionate part of this G.-R., which he himself is bound to pay to the ground-landlord, so that practically the tenant pays both the rent and the G.-R., the latter being so called because it issues out of the ground, in-

GROUNDSEL—GROUND SQUIRREL.

dependently of what is built upon it. Ground-rents often form a safe investment for capital, because the security is good. This security consists in the ground-landlord being able, whenever his G.-R. is in arrear, to dispossess the tenant and resume possession of the premises; and as the G.-R. is usually a small sum, he can scarcely fail to recover its full amount. This power to dispossess exists whether the tenant has paid his rent to his own landlord or not; but if at any time the tenant has been obliged to pay the ground-landlord the G.-R., which it is the duty of his own landlord in general to pay, he may deduct such sum from the next rent that he pays, or, as it is called, may set off the one against the other so far as it will go. Strictly speaking, there are thus two landlords: the ground-landlord is the over-landlord, and has the paramount security; the other landlord is landlord to the tenant who actually occupies, but is himself tenant to the ground landlord, for he merely holds a lease. He is what is called a mesne landlord. At the end of the 99 years, or whatever other term is fixed upon, the whole of the building becomes the property of the ground-landlord, for the interest of the builder or his assignees then lapses by effluxion of time; and as the building is a fixture, and cannot be carried away, it thus falls in to the landlord.—Ground-rent corresponds to *feu* in Scotland, with this difference, that the feu-rent in the latter case lasts for ever, there being no definite term fixed for its ceasing.

GROUNDSEL [AS. *grund*, ground; *swelgan*, to swallow]: common name of those species of *Senecio* (q.v.) which have small heads of flowers either destitute of ray or with the ray rolled back. The COMMON G. (*S. vulgaris*), one of the most plentiful of weeds in waste and cultivated grounds in most parts of Europe, is usually destitute of ray. It is a coarse-looking annual, of rapid growth, about 12 inches high, branched, with pinnatifid leaves, and small yellow heads of flowers; flowering at all seasons, even in winter, when the weather is mild; and its seeds, like those of other *Compositæ*, are widely diffused by means of their hairy pappus, being wafted about by the wind. It has a rather disagreeable smell; but birds are very fond of the young buds and leaves, and cage-birds are fed on them. It has a saltish taste, whence its name. Its leaves, beaten into a coarse pulp, and externally applied to the stomach, cause vomiting some hours after their application; it also makes a good poultice for boils and sprains.—Other species are weeds of very similar appearance, but are stronger, have a more disagreeable odor, and are viscid to the touch.—Like other annual weeds, the groundsels are to be hoed down or pulled as they appear, when the ground is in crop.—The G. tree, *Baccharis halimifolia*, is a composite shrub, 6–12 ft high, with angular branches, leaves usually obovate and scurfy, and flowers like those of common G. but larger. It is a native of the sea-coast from Mass. southward.

GROUND SQUIRREL (*Tamias*): genus of rodent quadrupeds of the Squirrel family, differing from the true

GROUP—GROUSE.

squirrels in the possession of cheek-pouches, in having a more slender body and shorter legs, and in other less important particulars; but most of all in their habits, residing chiefly on the ground, and seldom ascending trees to any considerable height. They are of small size, are all longitudinally striped on the back and sides, are extremely active and restless, and emit a peculiar 'chipping clucking



Ground Squirrel.

sound, very widely differing from the quacking, chattering cry of the squirrels.' A well-known species is the HACK-EE, or CHIPMUNK, or CHIPPING SQUIRREL (*T. Lysteri*) of N. America, of brownish-gray color, striped with black and yellowish white, the belly white. The fur is used for muffs, tippets, etc. Other species of G. S. are found in America, Asia, and Africa.

GROUP, *n* *grôp* [F. *groupe*, a cluster—from It. *groppo*, a knot or lump of anything: Ger. *kropf*, a crop, a crowl]: a small crowd or assemblage; an assemblage of figures or objects having some resemblance or character in common: V. to bring or place together in a cluster or knot. GROUP'ING, *imp.*: N. the art of arranging or combining the objects in a picture, etc., in harmony with the design; in *drawing*, one or more groups form the picture. A bunch of grapes, or a pyramid, are examples of model-forms of groups adopted by different artists. GROUPED, *pp.* *grópt.*—SYN. of 'group, *n.*': cluster; crowd; throng; assemblage; number.

GROUSE, *n.* *grôos* [prob. from OF. *griesche*, speckled, gray: comp. Gael. *cearc-raoch*, the heather-cock—from *cearc*, a cock; *fíraoch*, the heather], (*Tetrao*): genus of gallinaceous birds, which, as defined by Linnæus, included partridges, quails, and all the birds now forming the family *Tetraonidæ*, and divided into many genera. The *Tetraonidæ* have a very short bill, rather thick, sharp, and a little curved, and generally a naked red patch over or behind the eye. They have three toes before, and generally one hind toe high on the tarsus, but the hind toe is often very

GROUSE.

short, and sometimes lacking. Those to which the name G. is popularly given have the legs feathered to the feet, but in the genus *Tetrao*, as now restricted by ornithologists, the toes are not feathered; in moorfowl and ptarmigan, they are completely so, and these have therefore been separated into a distinct genus, *Lagopus*. Partridges, quails, etc., which have not the tarsi feathered, are regarded as connecting the families *Tetraonidae* and *Phasianidae*, and are sometimes referred to the latter, though their intimate connection with the former is generally recognized. Some of the *Tetraonidae* are polygamous, and this is the case with all, or almost all, the species of the genus *Tetrao*, while those of *Lagopus*, nearly allied to them, pair.—The genus *Tetrao* contains the largest birds of the family, exceeded in this respect by almost no other gallinaceous birds. They have a full figure, with much muscular power, the tail is longer than in most of the family, is of broad feathers, and generally rounded. The females differ considerably in plumage from the males, which are often resplendent in black, brown, green, and blue. The species are natives of the n. and temperate parts of Europe, Asia, and America, the regions in which the *Tetraonidae* in general are most abundant, though some of the family are found in warmer countries.—The largest species of *Tetrao* is the Capercailzie (q.v.), Wood G., or Cock of the Woods (*T. urogallus*); next to it, among European species, ranks the Blackcock (q.v.), (*T. tetrix*), the only other European species indeed, if the somewhat rare *T. hybridus* of continental Europe, the *Racklehahn* of the Swedes (see BLACKCOCK), be regarded as the result of a mere accidental intermixture of these two.—The PINNATED G., or PRAIRIE HEN (*T. cupido*) of N. America, is rather smaller than the blackcock; the general color of the plumage is yellowish-red, with bars and crossings of black; the tail is very short and much rounded. The male has neck-tufts of narrow feathers, the largest of which are five inches long, and is still more remarkably adorned with two loose pendulous wrinkled skins, extending along the sides of the neck for two-thirds of its length, capable of inflation with air, and when inflated, resembling in bulk, color, and surface, middle-sized oranges. This species of G. inhabits chiefly dry open districts, studded with trees or patches of brushwood. It was formerly common in N. J. and Penn., as well as on the western prairies, but has always become rare as a district has become cultivated and populous, notwithstanding laws for its preservation. It has almost disappeared from Kentucky, where it was at one time so abundant, that children were employed to prevent its depredations in the cultivated fields, and multitudes were shot and trapped merely to be thrown away. In the n.e. parts of the United States it exists, but is not abundant. It congregates in flocks in winter, which break up into smaller parties in spring. The males have many combats at the approach of the breeding season. Their voice is described as a low *tooting* or *booming*. They strut, after the manner of turkey-cocks, with wings let down to the ground, and neck-feathers erected. Certain spots, known in the w. parts

GROUT—GROVE.

of America as their *scratching-places*, seem to be specially appropriated for their displays and combats, and there considerable numbers often meet about daybreak, dispersing after the sun is up. Many are shot on such occasions. The food of the Pinnated G. consists of seeds, berries, the buds of trees and bushes, insects, etc. It is highly prized for the table in those parts of America where it is rare. The flesh resembles that of the blackcock.—The SPOTTED G., or CANADIAN G. (*T. Canadensis*), is smaller than the Pinnated G., about equal to the Scottish moorfowl. It inhabits the n. parts of America, and is plentiful near Hudson's Bay. It is found chiefly in forests of pine or fir, feeding much in winter on the leaves and branchlets of these trees, as well as on their seeds, whence it is often called the Spruce Partridge. From this food the flesh acquires a strong and peculiar flavor in winter. The plumage of the upper parts is mostly brownish-black, transversely barred with brownish-gray; in some parts varying to a rusty orange. The tail is rounded.—The DUSKY G. (*T. obscurus*) is a species almost as large as the capercailzie, native of the forests of the Rocky Mountains and the banks of the Columbia. The general color is blackish-brown, the wings lighter. The tail is large and rounded.—The MOORFOWL (q.v.), or RED G. of Britain is allied to the ptarmigans rather than to these species, and is called Red Ptarmigan by some systematic writers, though it is the species to which, in popular language in Britain the name G. is almost exclusively appropriated. For other species, often popularly called G., see BONASIA: COCK OF THE PLAINS: GANGA.

GROUT, n. *growt* [AS. *grut*, meal of wheat or barley: Icel. *grautr*, porridge: Dut. *grut*; Ger. *grütze*, groats]: coarse meal; a fine plaster for finishing ceilings; any solution of lime for cementing stones; an admixture of gravel and lime for cementing walls. GROUTING, n. finishing with grout.

GROUTS, n. plu. *growts* [Norw. *grut*; Dut. *gruyte*, dregs; Gael. *gruid*, grain, dregs: Dut. *gruis*, bran]: dregs; now usually called *grounds*, as of tea and coffee. GROUT-ALE, in O.E., poor ale from the grouts or grains of the first brewing: see GROUT.

GROVE, n. *grōv* [AS. *graef*, a cave, a grove: Gael. *craobh*, a tree: OE. *greaves*, trees, boughs]: cluster of trees, a not extensive piece of woods. GROVES, ancient places of idolatrous worship, being chosen as suitable, or planted for the purpose. The pleasantness and shelter of groves may have had something to do with this, but probably far less than the sentiments of awe naturally excited by the gloom of deep forests. Groves became so intimately associated with the idea of sacrifice and other religious rites, that the planting of a grove, sometimes even of a tree, became itself an act of religion, like the erection of an altar or the building of a temple. Thus, 'Abraham planted a "grove" (Heb. a tamarisk tree) in Beer Sheba, and called there on the name of Jehovah, the Everlasting God' (Gen. xxi. 33). In all but one of the many other instances of the word

GROVE—GROW.

'grove' in the King James's version of the Old Testament the translation is a mistake: the original is Asherah, meaning a tree-trunk or a post, a rude sort of idol, placed on a slight elevation and worshipped—said to have symbolized the generative powers; also called *Phallos* by the Greeks: compare Lat. *palus*, Eng. *pale* or *pole*.

GROVE, *grōv*, Sir GEORGE, D.C.L.: b. Clapham, England, 1820. He was trained as a civil engineer, and erected some of the first cast-iron light-houses in the W. Indies. As a member of the staff of Robert Stephenson, he was employed on railway works and the Britannia tubular bridge. He is known best for his services to music and to literature, as editor of *Macmillan's Magazine*, as a contributor to Smith's *Dictionary of the Bible*, but chiefly as editor (and part author) of the great *Dictionary of Music and Musicians*. He is a director of the new Royal College of Music.

GROVE, Sir WILLIAM ROBERT: English lawyer and physicist: b. Swansea, 1811, July 11. He studied at Oxford and, 1835 was called to the bar; 1871 he was raised to the bench, receiving knighthood 1872; and after the Judicature Act he became a judge in the high court of justice. He had highly distinguished himself in the subjects of electricity and optics, and was prof. of natural science at the London Institution 1840-47. In 1839 he invented the powerful voltaic battery known by his name. He contributed extensively to scientific journals, and published several very important lectures as those on the Progress of Physical Science (1842), the Correlation of the Physical Forces (1846), the Continuity of Natural Phenomena (1856). He was pres. of the British Assoc. 1842, received numerous distinctions, and was a fellow of various learned societies at home and abroad. He d. 1896, Aug. 2.

GROVEL, v. *grōv'l* [It. *grufolare*, or *grofolare*, to grub up with the snout like the hog: Icel. *grufla*, to feel with the hands, to grovel on the ground]: to creep on the ground; to be low or mean. GROVELLING, or GROVELING, imp. *grōc'el-ling*: ADJ. mean in life or character; without dignity. GROVELLED, or GROVELED, pp. *-ēld*. GROVELLER, or GROVELER, n. *-lēr*, one who.

GROVER, *grō'vēr*, CUVIER: 1829, July 24—1885, June 6; b. Bethel, Me.: soldier. He graduated at the U. S. Milit. Acad. 1850, entered the army as brev. 2d lieut. of artill., promoted 2d lieut. 1850, Sep.; 1st lieut. of inf. 1855, Mar.; capt. 1858, Sep.; maj. 1863, Aug.; lieut.col., 1866, July; brev. lieut.col., col. brig.gen., and maj.gen. U.S.A., and appointed col. 1st U. S. cav. 1875. In the civil war he served in the army of the Potomac and in the Dept. of the Gulf, commanded a div. and a corps, and attained the rank of brev. maj.gen. of volunteers.

GROW, v. *grō* [AS. *growan*, to grow: Icel. *groa*; Dut. *groeyen*, to grow, to flourish]: to increase in size or stature by a natural process; to increase or become greater; to be changing from one state to another; to vegetate; to cause to vegetate; to improve; to raise or produce, as corn; to proceed, as from a cause or reason. GROWING, imp.

GROWING CORN—GRUB.

ADJ. advancing in size or extent; increasing; thriving; producing. **GREW**, pt. *grô*, did grow. **GROWN**, pp. *grôn*: **ADJ.** increased in growth; arrived at full growth or stature. **GROWER**, n. one who raises or produces. **GROWTH**, n. *grôth*, the act of growing; increase; advancement. **GROWN OVER**, covered with a growth, as of creeping plants. **TO GROW OUT OF**, to issue from, as a branch from a tree; to result from. **TO GROW UP**, to arrive at full stature or maturity. **GROW TOGETHER**, to become united by growth. —**SYN.** of 'grow': to become; augment; enlarge; develop; issue; turn; proceed; accrue; adhere; swell; advance; raise.

GROWING CORN, in Law, on a farm, or on land let to a tenant: in England subject to distraint by the landlord for rent already due; but in Scotland, only for the rent which is current, and which will become due for the same year to which the crop belongs. In the United States, the laws vary in different states.

GROWL, n. *growl* [Dut. *grollen*, to cry as a cat: Norw. *gryla*, to grunt: F. *grouiller*, to rumble: prov. F. *grouler*, to grumble: Ger. *groll*, spite, rancor]: a deep angry snarl, as of a dog; an angry murmur. **V.** to snarl or grumble as an angry dog. **GROWLING**, imp. **GROWLED**, pp. *growld*. **GROWLER**, n. a grumbler; a snarler. **GROWLINGLY**, ad. *-li*.

GROWLER [named from a sound which it emits], (*Grystes salmoides*): fish of the Percé family, abundant in many rivers of the United States, e.g., in the neighborhood of New York. It attains a length of two ft. It is of olive color, dark on the upper parts, and becoming grayish-white beneath. The G. is much esteemed for the table, and affords good sport to anglers. It receives its name from a sound which it emits. The genus *Grystes* has small scales and only fine, card like teeth. Another species is found in the Macquarie river, in New Holland.

GROWSE, v. *grôz* [Ger. *grausen*, to shudder at: Bav. *gruseln*, to shudder]: in *Scot*, to chill before the ague-fit; to shiver: to have chills. **GROWSING**, imp.: **N.** a shivering. **GROWSIED**, pp. *grôzd*: see **GRUE**, which is a spelling of the same word.

GROWTH: see under **Grow**.

GROYNES, n. plu. *grôynz*: another spelling of **GROINS**, which see under **GROIN**.

GRUB, n. *grüb* [Dut. *grubbe*, a pit, a ditch: Low Ger. *grubbeln*, to root about with the hand: Ger. *grübeln*, to pick, to stir]: larva of coleopterous insects (see **COLEOPTERA**); a short worm that digs in the earth; a maggot. Different species are destructive to different kinds of plants: for the most important see the respective titles; see also the titles of the important cultivated plants for the grubs most hurtful to them. In *familiar slang*, food or victuals: **V.** to dig up with the hands or with a small instrument, as roots; to root out of the ground by digging; to work underground, as a grub; to work among, as by digging, generally for an object difficult to be reached. **GRUBBING**, imp.: **N.** the act of digging up by the roots. **GRUBBED**, pp. *grübd*.

GRUB—GRUB STREET.

GRUB, in Cattle and Sheep: a small worm hatched from the egg of the gad-fly. Cattle are attacked by the fly from June to Sep. The skin of the back is punctured and an egg deposited in each opening. The larvæ work their way under the skin and cause painful swellings. The wounds do not heal. In the spring the grubs, grown to considerable size, work their way through the apertures and bury themselves in the ground, where they undergo a transformation, and whence they appear as flies. The G. may be removed by pressure around the opening. The orifice should first be slightly enlarged with a sharp pen-knife. Sheep are attacked by the fly during the summer months. The eggs (some insist that the 'living young') are deposited in the nostrils of the sheep. The larvæ work their way upward to the maxillary sinuses, and attach themselves to the mucous membrane, where they remain until the next spring, when they fall to the ground, and in a few weeks are transformed. If attended to early they may be removed by the use of a feather dipped in oil of turpentine. Blowing tobacco smoke up the nostrils, and injections of dilute carbolic acid are also recommended. Smearing the noses of the sheep with tar is an excellent preventive.

GRUBBÆAN, a. *grüb-bē'ăn*: of or pertaining to the Grub Street writers or their productions; intellectually poor and mean. GRUB STREET, a street in London formerly occupied by the inferior class of writers

GRUBBER: the English name for an agricultural implement drawn by one or two horses and used for pulverizing the soil. In this country heavy harrows and cultivators made especially for working rocky soils, or land recently cleared of trees and in which stumps and roots remain, are sometimes called Grubbers. Unlike the plow the G. is not designed to turn the soil, but it is expected to do more thorough work in loosening it than can be performed with the ordinary harrow. It is made in various forms. When teeth are used it resembles the scarifier, and works to but little depth. When tines or coulter are used, the soil is more deeply stirred. It is frequently made with a small wheel at each end, by means of which the depth of working can be easily regulated. The operator guides its course by handles similar to those of a cultivator. In England the G. is largely used in working fallow fields and in the cultivation of root crops. In the United States a large and heavy hoe is sometimes called a G., properly a grub-hoe. The same term is also used to designate a thick ax used in cutting roots and removing stumps.

GRUB STREET: locality in London, thus described in Dr. Johnson's *Dictionary*: 'Originally the name of a street near Moorfields in London, much inhabited by writers of small histories, dictionaries, and temporary poems, whence any mean production is called *Grub-Street*.' The name has been changed to Milton street. One of the most entertaining of the old newspapers is the *Grub Street Journal*, which ended with its 418th number, 1737, Dec. 29, the

GRUDGE—GRUM.

principal writers of which are supposed to have been Dr. Richard Russel and Dr. John Martyn, and which was used, probably by Pope himself, certainly by his party, as a vehicle for attacks against the Dunces.

GRUDGE, n. *grŭj* [OF. *gruger*, to grieve, to mutter: Ice. *krutr*, a murmur: Gael. *gruig*, morose; inhospitable: Gr. *grudsein*, to grumble, to mutter]: secret enmity; ill-will; an old cause of quarrel; discontent: V. to give or take unwillingly; to be disagreeably parsimonious: to be discontented at another's enjoyments or advantages. **GRUDGING**, imp.: N. discontent at another's possessing, etc. **GRUDGED**, pp. *grŭjd*. **GRUDGER**, n. *-er*, one who. **GRUDGINGLY**, ad. *-lŭ*, with reluctance or discontent. —**SYN.** of 'grudge, n.': spite; pique; dislike; aversion; hatred; envy; quarrel; malice.

GRUE, or **GROUE**, v. *grô* [Scot.: Ger. *grauen*, to dread, to fear; *grausam*, frightful, horrible: Dan. *grue*, to fear: Gael. *grath*, a fierce look; *gruamach*, sullen, gloomy]: in *Scot.*, to have a chilly sensation passing over the body; to be aguish; to shudder; to shiver; to be filled with terror. **GRUING**, imp. **GRUED**, pp. *grôd*. **GRUESOME**, a. *grô'sum*, having a chilly sensation; aguish; frightful; fearful; loathsome.

GRUEL, n. *grô'ŭl* [F. *gruau*, oatmeal—from mid. L. *grütelum*—from *grütum*, meal: W. *grual*, gruel: Norw. *graut*, porridge: prov. F. *gruda*, husked oats or grain more or less broken]: a thin mixture, made by boiling oatmeal, or its flour, among water.

GRUFF, a. *grŭf* [Dut. *grof*; Dan. *grov*, coarse, big: Gris. *grufflar*, to snore]: rough or stern in manners or voice; harsh or surly. **GRUFFLY**, ad. *-lŭ*. **GRUFFNESS**, n. roughness of manner or voice.

GRUGINGS, n. plu. *grŭj'ingz* [Norm. F. *grugeons*]: the same as **GURGEONS**, which see.

GRUGRU, *grô'grô*: grub or larva of *Calandra palmarum* (called also *Rhyncophorus palmarum*, and *Cordylia palmarum*); insect of the weevil family (*Rhyncophoræ*) inhabiting Guiana and other tropical parts of America. The perfect insect is an inch and a half long. The grub is an ugly inactive creature of whitish cream color, as long and as thick as a man's thumb, and lives in the soft and spongy central part of the Cabbage Palm (*Euterpe oleracea*), on which it feeds. It is extremely fat and oily, and is esteemed a great delicacy, not only by the Indians, but by many of the European colonists and their descendants, particularly the Dutch. It is cooked by roasting, and eaten with bread and butter, after being sprinkled with cayenne pepper. The fragrance of roasted grugru is said to be most tempting to epicures. A cabbage palm which has been cut down often becomes in a short time almost filled with grugrus; but they are obtained usually from the upper part of the stem of growing palms near the crown. A negro is often sent up with a cutlass, to cut them out of the wood.

GRUM, a. *grŭm* [Dan. *grim*, atrocious: AS. *grom*, fierce:

GRUMBLE—GRUNDTVIG.

Gael. *gruaim*, a surly look: W. *grwm*, a growl]: sour; surly. GRUM'LY, ad. -lŷ, in a surly manner: ADJ. surly; morose. GRUMBLE, v. *grām'bl* [Dut. *grommelen*; F. *grommeler*, to murmur]: to express discontent in a low murmuring voice; to growl; to make a hoarse rumbling noise. GRUM'BLING, imp. N. a murmuring through discontent. GRUMBLED, pp. *grām'bl'd*. GRUMBLER, n. -blér, one who grumbles; a discontented man. GRUM'BLINGLY, ad. -lŷ.

GRUMBLE, etc.: see under GRUM.

GRUME, n. *gróm* [OF. *grume*, a knot, a cluster: L. *grūmūs*, a little heap or hillock: It. *grumo*, a clot of blood]: a fluid thickened: a clot, as of blood. GRUMOSE, *gró-môs*, or GRUMOUS, a. *grómūs*, thick; clotted; knotted; in bot., in clustered grains—applied to fleshy tubercular roots. GRU'MOUSNESS, n.

GRUMPY, n. *grūm'pŷ* [Dan. *grum*, ferocious: W. *grwm*, a murmur, a growl (see GRUM)]: querulous; complaining; brooding and melancholy, over real or fancied injuries. GRUMPH, v. *grūmf*, in prov. Eng., to grumble; to growl. GRUMPHING, imp. GRUMPHED, pp *grūmft*.

GRÜN, ANASTASIUS (pseudonym for AUERSPERG, ANTON ALEXANDER, Count VON): 1806, Apr. 11—1876; b. Laibach, cap. of the Austrian duchy of Carniola. He was educated at Gratz and at Vienna, studying jurisprudence. In 1848 and 60, he was active in politics, as an intrepid and powerful upholder of political and religious liberalism—latterly in the Austrian house of lords. He had great fame as a poet: publishing among other poems, the following: *The Last Knight* (1830), *Walks of a Vienna Poet* (1831), *Ruins* (1835). His fiction was often majestic, and his conception were striking and original. His most popular short poem is *The Last Poet*.

GRUNBERG, *grūn'bĕrch*, or GRÜNEBERG: town of Prussia, province of Silesia, prettily situated near the n. boundary of the province, on the Golden Lunse, 59 m. n.n.w. of Liegnitz. It consists of the town proper surrounded by a wall pierced by three gates, and of four important suburbs, and is seated amid vine-clad mountains. G. is known chiefly for the fine sparkling wine extensively produced in the vicinity. The 700th year of its trade in this excellent commodity was celebrated 1850, Oct. G. has also an active trade in the manufacture of woolen cloths and tobacco, and in the growing of fruit. Pop. (1890) 16,092.

GRUNDTVIG, *grūnt'vĭg*, NIKOLAI FREDERIK SEVERIN: 1783, Sep. 8—1872, Sep. 2; b. Udby, island of Seeland: poet and theologian. He was educated in the free school of Aarhus, Jutland, and the Univ. of Copenhagen; spent several years studying theol., Icelandic literature, languages and Shakespeare, Schiller, and Fichte; published *Northern Mythology* 1808, *Decline of the Heroic Life in the North* 1809, and a number of poetical works and paraphrases 1812–22, meanwhile preaching to a large congregation in Copenhagen; published *The Church's Reply*—for which he was prosecuted, fined, and forbidden to preach for seven years—1825

GRUNDY—GRYPHIUS.

and *Songs for the Danish Church* 1837; resumed preaching 1839; was prominent in politics from 1844 till after the first German war; and received the titular rank of bp., but without a see, 1861.

GRUNDY, *grün'dī*, in the phrase MRS. GRUNDY: in Tom Morton's 'Speed the Plough' occur the expressions, 'What will Mrs. Grundy say?' 'What will Mrs. Grundy think?'; a general name for outside fault-finders and busy-bodies; the world in general.

GRUNT, n. *grünt* [F. *grogner*, to grunt—from L. *grunnirē*, to grunt: Ger. *grunzen*, to grunt, to mutter]: a short rough sound, as uttered by a hog or sow: V. to utter a short rough sound, as a hog; to snarl GRUNTING, imp.: ADJ. uttering grunts: N. the sounds uttered by a hog; the act of one who grunts. GRUNTED, pp. GRUNTINGLY, ad. -lī.

GRUS, n. *grūs* [L. a crane]: in *astron.*, the *Crane*, a constellation introduced by Bayer, and now arranged as one of Lacaille's 27 southern constellations: it is between Eridanus and Sagittarius.

GRUS AND GRUIDÆ: see CRANE.

GRUYERE, or GROUYERES, *grü yür'*: small decayed town of Switzerland, canton of Freiburg, 16 m. s.s.w. of the town of Freiburg, about a m. from the left bank of the Saane or Sarine. The town is known chiefly from its giving name to the famous Gruyères cheese, which is made in great quantities in the surrounding district. It owes its flavor chiefly to *Melilotus officinalis*. Pop. about 1,200.

GRYLLUS, *grīl'ūs*: Linnæan genus of insects of the ord. *Orthoptera*, answering to the section *Saltatoria* (Lat. leapers) of later entomologists, and containing crickets, grasshoppers, locusts, etc. The genus has been subdivided into many genera, which have been grouped into families; but great confusion exists in the nomenclature, the crickets and their allies being the genus *Gryllus*, and family *Gryllidæ* of some authors, *Acheta* and *Achetidæ* of others; grasshoppers being *Gryllus* and *Gryllidæ* of some, *Locusta* and *Locustidæ* of others; and locusts, in like manner, being *Locusta* and *Locustidæ*, or *Acyrdium* and *Acyrdidæ*: see CRICKET: GRASSHOPPER: LOCUST. The three groups are very closely allied. They all are characterized by the large thighs of the last pair of legs, and great power of leaping. The stridulous sounds which they emit are produced in some—crickets and grasshoppers—by rubbing together the bases of the elytræ; in others—locusts—by rubbing the thighs against the elytræ. The females lay their eggs usually in the ground.

GRYPHÆA, n. *grī-fē'ă*, or GRYPHITE, n. *grī-fīt* [L. *gryps*; Ger. *grups*, a griffin]: in *geol.*, a sub-genus of the oyster family, abounding in the lias, oolite, and chalk formations.

GRYPHIUS, *grī-fē-ūs*. SEBASTIAN: 1493-1556; b Reutlingen, in Swabia: printer. He came as a youth to Lyon, and died there; having (1528-47) issued more than 800

GRYPHON—GUACHARÓ.

works, notable for accuracy and clear type. G. preferred a large bold Italic type. Among the more noted works are the fine Latin Bible of 1550, and Dolet's *Commentaria Linguae Latinae* (1536). The original German spelling of the Latinized name G. is *Gryph*, the French *Gryphe*. The well-known emblem on G.'s publication is a griffin. G.'s sons, Antoine and François also were famous French printers.

GRYPHON, n. *grīf'ōn* [Gr. *grups*, a griffin]: another spelling of GRIFFIN, which see.

GRYPINÆ, n. *grīp'ī-nē* [mod. L. *grypus*, *gryphus*]: in *ornith.*, wedge-tailed humming-birds, sub-family *Trochilidæ*, of which *Grypus* is the type: see HUMMING-BIRDS.

GRYS-BOC, *grīs'bōk* (*Antilope melanotis* or *Calotragus melanotis*): animal of the antelope family, native of s. Africa, and common in most parts of Cape Colony. It is about three ft. in length, and about a foot and a half in height at the shoulder. The grysboc lives in pairs on the plains. It is not very swift, is easily captured, and its flesh is much esteemed.

GUACHARO, *gwá-chá'rō* (*Steatornis Caripensis*): remarkable S. American bird, of the ord. *Insesores*, tribe *Fissirostres*, generally referred to the family *Caprimulgidæ*, but widely differing from the goatsuckers and most of that family, and indeed from the *Insesores* generally, in having a strong bill and being frugivorous. The food of the G. consists of hard and dry fruits. It is about the size of a common fowl; the plumage brownish gray with small black streaks and dots. The G. is a nocturnal bird, singular among frugiv-



Guacharo (*Steatornis Caripensis*).

orous birds. It spends the day in deep and dark caverns, where great numbers congregate and make their nests. Humboldt gives an interesting account, in his *Personal Narrative*, of a visit to the great Guacharo cavern in the valley of Caripe, near Cumana. This cavern is visited once a year for the sake of the fat of the young birds, which

GUACHINANGO—GUADALAVIAR.

soon after being hatched become almost a mass of fat, and which are slaughtered in great numbers, and their fat melted and stored for use as butter or oil. The clarified fat is half liquid, transparent, inodorous, and will keep for a year without becoming rancid.

GUACHINANGO, *gwá-chē-nán'gō*: small town of Mexico, in the north of the state of Puebla, 103 m. n.e. of the city of Mexico. Pop. 6,000.

GUACHOS (better *Gauchos*): horsemen of the great plains of S. America, especially of the Argentine Republic. They live in rude huts with scanty furniture, and are employed chiefly in breeding and breaking-in horses, in herding, catching, and slaughtering cattle. They and their women are usually tall and handsome, and are mainly of pure Spanish blood, having mixed little with the Indians. The G. are most expert horsemen, and use the lasso (q.v.) and bolas with marvellous skill. They are hospitable, but violent and vindictive, and are much given to drink and gambling. They have been prominent in S. American political history, but as a distinct class are decreasing in numbers.

GUADALAJARA, *gwá-thá-lá-chá'rá*: province of Spain, most n. eastern of the five modern provinces into which New Castile has been divided. 4,869 sq. m. The soil is generally good. Iron abounds, and has been worked from early ages. Pop. (1900) 200,186. See CASTILE.

GUADALAJA'RA (anc. *Arriaca*): decayed town of Spain, cap. of the province of G.; on the left bank of the Henares, 38 m. n.e. of Madrid, 2,395 ft. above sea-level. It is a large, ill-built town, many buildings of interest are falling to ruin from neglect. The chief of these are the palace of the Mendozas, feudal lords of G.; the *Panteon*, in which they are buried; and the churches of San Francisco and San Esteban. G. is the chief town of the fine pastoral and wheat district of the Alcarria. Pop. 8,650.

GUADALAJARA, or (older spelling) **GUADALAXARA**, *gwá-thá-lá-chá'rá*: capital of the state of Jalisco or Xalisco, Mexico; on the Rio Grande de Santiago, abt. 280 m. w.n.w. of the city of Mexico. As the houses are generally but two stories high, the place covers much territory. It contains the govt. buildings, a cathedral, a mint, an episcopal palace, an opera, large barracks, a college, and many inferior seminaries. It has well-supplied markets, and extensive manufactures of cotton and earthenware; confectionery and excellent silk embroidery also are made. Of the import trade 1878, Great Britain had abt. 40 per cent., France 25, United States 10, Germany 8. Pop. (1900) 101,208.

GUADALAVIAR, *gwá-thá-lá-vē-ár'*, or **TURIA**, *tū'rī-a*: river of Spain, rising near the source of the Tagus, in the s.w. of Aragon, and after a course of 130 m., generally s.s.e., falls into the Mediterranean, at Grao. a mile and a half e. of Valencia. The G., in passing through the beautiful gardens of Valencia, is divided, for irrigation, into eight canals. Its mouth is much silted up.

GUADALQUIVIR—GUADELOUPE.

GUADALQUIVIR, *gwá-thál-kē-vēr'* (Arab. *Wad-al-Kebir*, the great river; anc. *Baetis*): most important river of Spain, for mass of waters, and for extent of its natural navigation. It rises in the Sierra de Cazorla, near the e. border of the province of Jaen; flows generally s.w. through the provinces of Jaen, Cordova, Sevilla; and forming the boundary for about ten m. between the provinces of Huelva and Cadiz, falls into the Atlantic at San Lucar de Barrameda, after a course of about 360 m. The principal towns upon its banks are Montoro, Cordova, and Sevilla, to the last of which, about 80 m. above its mouth, the river is navigable. Below Sevilla it twice divides itself into two branches, forming two islands—Isla Menor and Isla Mayor. Its chief affluents are the Gadajos and the Jenil on the left, and the Guadalimar and the Guadiato on the right. The lower course of the G. is sluggish and dreary in the highest degree; the stream turbid and muddy, eats its way through an alluvial level given up to herds of cattle and aquatic fowls. There are no villages in this district, which, though favorable to animal and vegetable life, is fatal to man, from the ague and fever caused by the numerous swamps. There is no great trade on the G.; foreign vessels are generally moored at the Isla Menor, and their cargoes sent up to Sevilla on barges.

GUADALUPE, *gaw-da-lóp'*, Sp. *gwá-thá-ló'pā*: river rising in s. Texas, flowing s.e. and emptying into Espiritu Santo Bay, after a course estimated at about 250 m. The geography of this stream and its capabilities are not yet well-known.

GUADALUPE MOUNTAINS, *gaw-da-lóp'*: in New Mex. and Tex., between the Rio Grande and the Pecos rivers. They are a side-chain from the Rocky Mountains, with which they unite on the north.

GUADALUPE-Y-CALVO, *gwá-thá-ló'pā-ē-kál'vō*: town of Mexico, state of Chihuahua; 170 m. s.s.w. of the town of Chihuahua in a mountainous district near important silver mines. Pop. 10,000.

GUADELOUPE: island of the Lesser Antilles in the W. Indies, the most important of those which belong to France; lat. 16° n. and long. 61° 45' w.; 500 sq. m. It is divided into Grande Terre on the e., and Basse Terre or Guadeloupe Proper on the w., by a strait of about 40 yards in width, which, under the name of Salt river, is navigable for vessels of 50 tons. The nomenclature of the separate islands is apparently out of place, for of the two, Basse Terre is the highest, and Grande Terre is the smallest. Grande Terre, generally low, is of coral formation; Basse Terre, is traversed by volcanic mountains, which culminate in La Soufrière (the 'Sulphur Mine') 5,108 feet. Though this range shows no regular crater, yet it emits, by several orifices, columns of smoke, and even sparks of fire. In addition to these symptoms of subterraneous action, there is a boiling spring and earthquakes are frequent. Basse Terre, on the islands of its own name, is the chief town, having an inferior harbor.

GUADIANA—GUAIAIACUM.

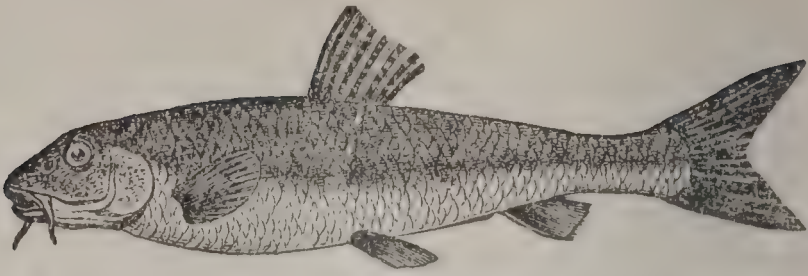
Connected with G., as dependencies, are the neighboring islets of Desirade, Marie Galante, Les Saintes, and the n. part of St. Martin. In 1901 exports to France amounted to 17,476,469 francs; imports from France to 20,592,816 francs. In 1848, slavery was abolished by a decree of the French republic. The island was discovered by Columbus 1493; but it was not colonized by the French till 1635; and after repeatedly falling into the hands of England, during war, it was at length permanently ceded to France 1816.—Pop. including dependencies (1880) 158,470, three-fourths being colored; (1889) 165,899; (1901) 182,110.

GUADIANA, *gwā-dē-ā'nā*, Sp. *gwā-thī-ā'nā* (anc. *Anas*): one of the longest though narrowest and poorest in volume of the five great Spanish rivers. It rises on the w. boundary of Murcia, about 8 m. n.w. of the town of Alcaraz; flows n.w. about 30 m., then disappears among swamps; flows underground in a westward direction nearly 30 m.; and appears again at Daymiel, after throwing up in its subterraneous course numerous lakes called *Los ojos* (the eyes) *de la Guadiana*. From Daymiel it flows w. through La Mancha and the province of Estremadura, until, passing the town of Badajoz, it bends s., forming for about 35 m. the boundary between Spain and Portugal. Near the town of Monsaras it enters the Portuguese territory, and passes through the e. district of the province of Alemtejo. Finally, turning e., and again forming the international boundary for about 30 m., it enters the Atlantic below the town of Ayamonte. It is about 520 m. in length, navigable only about 35 m. Its chief affluents are the Giguela on the right, and the Javalon and Ardila on the left.

GUADIX, *gwā-theēh'*: city of Spain, in province of Granada, on the n. slope of the Sierra Nevada, above the left bank of the G. river, surrounded by ancient walls, said to have been the first episcopal see erected in Spain. G. was formerly noted for its cutlery. It is still the see of a Rom. Cath. bp., contains a cathedral, ruins of a Moorish castle, and manufacturies of earthenware, hemp goods, and hats, and has several warm mineral springs in its vicinity. Pop. about 12,500.

GUADUAS, *gwā'thwās*: city of the United States of Colombia, in the portion of the republic lying in S. America. It stands near the east or right bank of the Magdalena; high among the Andes, and is one of the most elevated towns on the globe, being 8,700 ft. above sea-level. Pop. about 4,000.

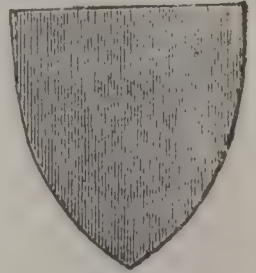
GUAIAIACUM, n. *gwā'yā-kūm* [Latinized from Sp. *guayaco*]: genus of large evergreen trees of the nat. ord. *Zygophyllaceæ*, natives of the tropical parts of America, having abruptly pinnate leaves and axillary flowers on one-flowered stalks, often in small clusters. The flowers have a 5-partite calyx, five petals, ten stamens, and a tapering style, the fruit is a capsule, 5-angled and 5-celled, or the cells by abortion fewer, one seed in a cell. The trees of this genus are remarkable for the hardness and heaviness



The Common Gudgeon (*Gobio fluviatilis*).



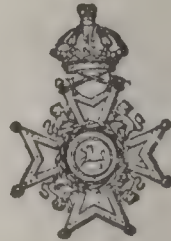
Guinea of George II.



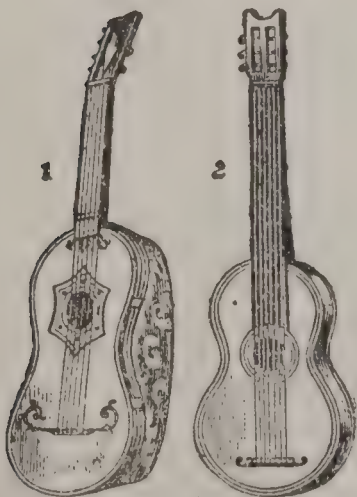
Gules.



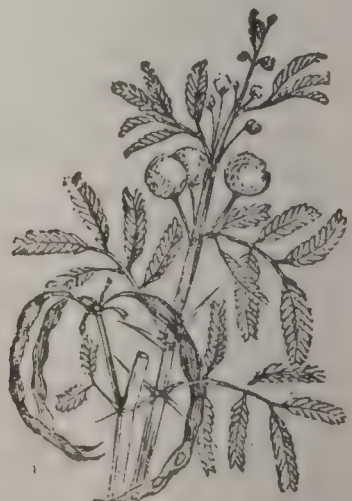
Red Grouse (*Tetrao* or *Lagopus scoticus*).



Badge of Guelphic Order.



1, French Guitar of the Seventeenth Century; 2, Modern Guitar.



Gum-arabic Plant (*Acacia Senal*).

GUAÏACUM.

of their wood, generally known as *Lignum Vitæ*, but sometimes as *G. Wood*, sometimes as *Brazil Wood*; as well as for their peculiar resinous product, *Guaiacum* (shortened into *Guiac*, *gwī'āk*), often incorrectly called *Gum G.* The species to which the commercial *lignum vitæ* and *G.* are commonly referred, is *G. officinale*, native of some W. India islands, and of some continental parts of America; a tree sometimes 30 or 40 ft. high, with two or three pairs of ovate, obtuse, and perfectly smooth leaflets, pale-blue flowers, a furrowed bark, and generally a crooked stem and knotty branches. It is probable, however, that other species, as well as this, supply part of the *G. wood* and resin of commerce. At present, these are obtained chiefly from Cuba, Jamaica, and St Domingo. The wood is imported in billets about three ft. long, and 12 in. in diameter, of greenish-brown color. This is the color of the heartwood, the sap-wood is pale yellow. *G. wood* is remarkable for the direction of its fibres, each layer of which crosses the preceding diagonally; annual rings are scarcely observed, and the pith is extremely small. It sinks in water. It is much valued, and used for many purposes, chiefly by turners; ships' blocks, rulers, pestles, and bowls (see *BOWLS*) are among the articles commonly made of it. When rubbed or heated, it emits a faint disagreeable aromatic smell; its taste is also pungent and aromatic. Shavings and raspings of the wood are bought by apothecaries for



Guaiacum Officinale.

medicinal use. The bark also is used in medicine on the continent of Europe, though not in Britain. The virtues of both wood and bark depend chiefly on the resin which they contain, which is used in powder, pill, and tincture. It is an acrid stimulant, beneficial in chronic rheumatism,

GUAICURÚS—GUAN.

in chronic skin diseases, in certain cases of scanty and painful menstruation (hence occasionally a remedy in cases of sterility), and in chronic catarrh. It has been highly praised also as a preventive of gout. The resin is an ingredient of the well-known *Plummer's Pills*. In the 16th and 17th c., G. was the remedy most in repute for syphilis. The resin sometimes flows spontaneously from the stem of the trees; it is sometimes obtained artificially. It is of greenish-brown color, and has a brilliant resinous fracture. It has scarcely any taste, but leaves a burning sensation in the mouth. One of the most striking characteristics is, that it is colored blue by its oxidizing agents. It contains *guaiacic acid* ($C_{12}H_{16}O_6$), which closely resembles benzoic acids, and yields, on distillation, certain definite compounds known as *guaiacine*, *pyroguaiacine*, and *hydride of guaiacyl*.—*Guaiacol*, *gwā'yă-kōl* [Lat. *oleum*, oil], is a colorless aromatic ether obtainable from the resin.

GUAICURÚS, *gwī-kô-rós'*: large tribe of Indians living in the valley of the Paraguay river, in Brazil, having a harmonious but guttural language, copper-colored skin, and long straight hair. They have three castes, nobles, warriors, and slaves. A few of their number were converted to Christianity by missionaries many years ago, but the great majority remained and still are pagans.

GUALDO TADINO, *gwāl'do tá-dē'no*: town of Italy, province of Perugia, 22 m. n. of Foligno, 58 m. from Ancona, on the railroad running from Ancona to Rome, and the post road leading to Furlo Pass of the Apennines. It was once fortified, and governed itself under the protectorate of Perugia. The ancient Roman town of Tadinum, the ruins of which were discovered 1750, was in the vicinity of G. T., near the Church of Sta. Maria Tadina. The town was incorporated with the Roman states 1815, and created a city by Pope Gregory XVI. 1833. Pop. 7,800.

GUALEGUAYCHÚ, *gwā-lī gwī-chō'*: city in the province of Entre Rios, Argentine Republic, S. America, on the river of the same name. It is in a fine grazing region, has large cattle and sheep interests, and exports large quantities of beef, mutton, hides, wool, tallow, horns, bone manure, and other animal products. The city is well built, has wide and regular streets, is very cleanly, and has numerous factories for its various animal industries. Pop. (1849) 7,000; (1900) about 15,000.

GUAM: an island in the Pacific Ocean, the largest of the Marianne, or Ladrone group, with an area of 200 sq. m. Inhabitants number about 9,000, and are descendants of emigrants from the Philippine Islands, the original population having become extinct, of whom 6,000 are in Agana, the capital. Spanish is the recognized language, but English is also spoken. The island is thickly wooded, well watered, and fertile. In 1898 it was ceded to the United States by Spain. The new cable between San Francisco and Manila (1903) touches the island.

GUAN, n. *gū-ăn'*, or **YACOU** (*Penelope*): genus of large.

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gallinaceous birds of the family *Cracidae*. They have a naked skin on the throat capable of being inflated or swollen, and a naked space around each eye. The name G. belongs particularly to *Penelope cristata*, a species of which the entire length is about 30 inches, native of the forests of Brazil and Guiana long domesticated in S. America. It was found at the end of last century that the G. could endure the climate of Britain and of Holland, and hopes were entertained of its becoming domesticated in the poultry yards of Europe and America; but success in any instance has not been recorded. Its flesh is much esteemed for food.



Guan (*Penelope cristata*.)

GUANABACO'A: see HAVANA.

GUANACO. n. *gwá-ná'kō* [Sp.—from Peruvian, *huanacu*], (*Auchenia huanaca*): ruminant animal common in S. America and most abundant in Patagonia, Peru, and Chili, believed by some authorities to constitute a distinct species, and by others to belong to the camel family, to be a wild variety of the llama, and to be allied to the alpaca (see AUCHENIA: ALPACA). They are vigilant and shy, live in flocks on the mountains, descend to the plains in search of food, are readily tamed, about 3 ft. high at the shoulders, of a reddish brown color, and with fine soft wool 4–6 inches long. The G. is very swift in motion, ejects offensive saliva when attacked or displeased, has a peculiar cry somewhat resembling the neighing of a horse, and its flesh furnishes food and its skin clothing to the Patagonian Indians. It has great curiosity, by exciting which hunters draw it within reach of their rifles. Dr. Cunningham says its general appearance combines some of the characters of the camel, deer, and goat.

GUANAHANI, *gwá-ná-há'nē*, or CAT ISLAND: one of the Bahamas, generally regarded as Columbus's first discovery in the new world, being presumed to be identical

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with the San Salvador of the illustrious navigator. Recent criticism, however, appears to have transferred this honor to Watling Island (q.v.), about 50 m. e.s.east.

GUANAJUATO, or **GUANAXUATO**, *gwá-ná-čhwá'tō*: inland state of Mexico, lat. 20° — 22° n., long. 99° $40'$ — 102° $40'$ w.; bounded n. by the states of San Luis Potosi, e. by Queretaro, s. by Michoacan, w. by Jalisco; 11,400 sq. m. The surface, a portion of the lofty plateau of Anahuac, 6,000 ft. above sea-level, is traversed by chains of mountains, among which those of Santa Rosa are porphyritic, with elevations of 11,400 ft. The state is watered by no large river. The soil is fertile; maize, wheat, and frijoles (beans) are the chief grain crops raised; the vine, the *chili colorado*, or red pepper, and the olive, are largely cultivated. Among valuable mineral products of the state are silver, iron, lead, and copper, the first in greatest abundance. The manufactures are woolens, cottons, leather, earthenware, and refined sugar. The climate is mild and the air pure. Pop. (1900) 1,065,317 three races—25 per cent. being whites, 39 per cent. Indian, and 36 per cent. mixed.

GUANAJUATO, or **GUANAXUATO**, or **SANTA FE DE G.** *sán'tá fā dā*: city in Mexico, cap. of the state of G.; irregularly built on an extremely uneven district of hill and valley; lat. 21° n., and long. 100° $50'$ w. The streets are steep and tortuous, but the houses are generally well built, and gayly painted, green being the favorite color. It contains many fine public buildings, the chief of which are the cathedral, the monasteries (eight in number), the college, the gymnasium, the theatre, and the mint. G. was founded 1534 as the centre of the greatest silver-mining district in the world: within a circuit of five leagues there are more than 100 mines. Pop. formerly abt. 100,000; (1890) 52,112; (1900) 41,486.

GUANAPARO, *gwá-ná-pá'rō*: river of Venezuela, S. America, rising in the dept. of Caraccas, and, after an easterly course of 230 m. joining the Portuguesa, which through the Apure sends its tribute to the Orinoco.

GUANARE, *gwá-ná'rā*: river of Venezuela, S. America, affluent of the Portuguesa: see **GUANAPARO**. On its banks are two towns, both named from it: Guanarito, an inconsiderable place; and Guanare, city of 12,000 inhabitants.

GUANCABELICA: see **HUANCABELICA**.

GUANCHES: aboriginal and now extinct race of the Canary Islands, regarded by some as Libyans who fled thither on the conquest of Barbary by the Arabs, and by Humboldt as belonging to an old-continent race, probably the Caucasian. The former belief is strengthened by the fact that the few known words of their language are somewhat analagous to certain Berber dialects. They were large in stature, olive in complexion, and mild in character, believed in an invisible creator, an evil spirit, future happiness for the good and punishment for the bad, and

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embalmed their dead and preserved their bodies in catacombs.

GUANINE, *gwá'nín*: yellowish-white, amorphous substance, named from its being a constituent of guano; it, however, also forms the chief constituent of the excrement of spiders, has been found attached to the scales of fishes, e.g. the bleak; and seems a normal constituent of the mammalian liver and pancreas. G. belongs to that class of bodies formerly called bases, but which, from their combining equally with acids, bases, or salts, are now often termed amides or amide-like compounds. By oxidation with permanganate of potash, it is converted into urea, oxalic acid, and oxyguanine, a substance not yet sufficiently studied. With regard to its occurrence in guano, as it has not been found in the recent excrement of sea-birds, there is every reason to believe that it is formed by slow oxidation (from atmospheric action) of the uric acid, much as uric acid can be made to yield urea and oxalic acid. And in the pancreas and liver it probably represents one of those transitory stages of disintegrated nitrogenous tissue finally excreted by the kidneys in the more highly oxidized form of urea.—GUA'NIDINE, n. *-nĩ-dĩn*, a derivative of guanine, forming colorless crystalsoluble in water and alcohol.

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GUANO, n. *gû-â'nô* or *groâ'nô* [Sp. *guano*, or *ñuano*, from Peruvian, *huanu*, dung]: excrementitious deposit of certain sea-fowl, which occurred in immense quantities on certain coasts and islands, especially on the coast of S. America, where the climate is dry and free from rain. Although the use of G. as a manure is comparatively recent in the United States and in Europe, its value was well known to the Peruvians long before they were visited by the Spaniards. We learn from the *Memoriales Reales* of Garcilaso de la Vega, published 1609, that in the times of the Incas no one was allowed, under pain of death, to visit the G. islands during the breeding season, or, under any circumstances, to kill the birds which yield this substance; and that overseers were appointed by the govt. to take charge of the G. districts, and to assign to each claimant his due share of the material. Alexander von Humboldt first brought specimens of G. to Europe 1804, and sent them to Fourcroy, Vauquelin, and Klaproth, the best analytical chemists of the day.

A useful little pamphlet, *The History and Properties of the Different Varieties of Natural Guano*, by Nesbit, states that the quality and value of these manures commercially depend almost wholly on the amount of decomposition to which they have been subjected by the action of the atmosphere. The fecal matter of the fish-eating birds, which, by its long accumulation, forms the G. deposits, consists essentially of nitrogenous and phosphatic compounds, the former chiefly ammonia salts derived from the decomposition of the uric acid and urates which exist in the fresh excrements of these birds. The ammoniacal portion, and some of the phosphates, are moderately soluble in water, and are readily washed away by rain. The late Prof. Johnston remarked, that 'a single day of English rain would dissolve out and carry into the sea a considerable portion of one of the largest accumulations, and that a single year of English weather would cause many of them entirely to disappear.' In dry climates, where very little rain falls, as in some parts of Bolivia and Peru, on the w. coast of S. America, the dung deposited suffers very little from the action of the atmosphere, and retains nearly the whole of its soluble nitrogenous and phosphatic compounds. Guanos, on the other hand, found in regions where rain falls freely, lose a great part of their soluble constituents, but remain rich in their less soluble constituents—the phosphates of lime and magnesia. Nesbit divides guanos according to their composition, into three classes: 1. Those which have suffered little by atmospheric action, and which retain nearly the whole of their original constituents, such as the Angamos and Peruvian guanos. 2. Those which have lost a considerable portion of their soluble constituents, such as the Ichaboe, Bolivian, and Chilian guanos. 3. Those which have lost nearly all their ammonia, and contain but little more than the earthy phosphates of the animal deposit. Many of these are largely contaminated with sand. In this class we place the various African guanos (excepting that from Ichaboe),

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W. Indian G., Kooria Moorla (islands off the coast of Arabia) G., Sombrero G., Patagonian G., Shark's Bay G., (from Australia), etc.

Most of the so-called Peruvian G. has been obtained from the Chincha Islands, three in number, about 12 m. off the coast of Peru, between 13° and 14° s. lat. Each of these islands is from 5 to 6 m. in circumference, and consists of granite covered with G. in some places to a height of 200 ft. in successive horizontal strata, varying in thickness from 3 to 12 inches, and in color from a light to a dark brown. Sometimes, however, is found a vertical surface of more than 100 ft. of perfectly uniform appearance. If Humboldt's statement is correct, that 'during 300 years the coast-birds have deposited G. only a few lines in thickness,' the extreme age of the lower strata becomes obvious.

The following table represents the mean of 78 samples of Peruvian guanos, analyzed by Mr. Way:

Moisture.....	13·67
Organic matter and salts of ammonia.....	52·05
Earthy phosphates.....	22·78
Alkaline salts containing 3·34 phosphoric acid, } and equal to 6·89 soluble phosphate of lime. }	9·67
Sand, etc.....	1·83
	<u>100·00</u>
Ammonia, per cent.....	16·52

The following, from Muspratt's *Chemistry*, gives the mean of several analyses of the inferior kinds of G. the first four belonging to Nesbit's second class, the remaining three to his third class:

	Icha- boe.	Icha- boe.	Chil- ian.	Boliv- ian.	Pata- gonian.	Koorla Moorla.	Saldan- ha Bay.
	Earlier car- goes.	Recent car- goes.					
Moisture	27·3	20·0	20·4	10·0	25·0	18·1	20·0
Organic matters and salts of ammonia...	34·3	24·4	18·6	21·6	18·3	12·4	14·9
Earthy phosphates.....	30·3	20·4	31·0	51·5	44·0	42·7	56·4
Alkaline salts.....	5·0	6·2	7·3	14·1	2·1	4·2	5·8
Carbonate of lime						4·1	
Sand, etc.	3·1	29·0	22·7	2·7	10·6	18·5	2·9
	<u>100·0</u>	<u>100·0</u>	<u>100·0</u>	<u>100·0</u>	<u>100·0</u>	<u>100·0</u>	<u>100·0</u>
Ammonia per cent.....	7·3	6·0	5·47	4·5	2·5	2·05	1·47

The nitrogen in these analyses is calculated as ammonia for the purpose of comparison. In reality, it exists in various forms of combination—viz., as uric acid, urea occasionally, urate, oxalate, hydrochlorate, phosphate, etc., of ammonia, other urates, guanine (q.v.), and undefined nitrogenous compounds. Hence a complete analysis of G. is a work of considerable labor; but as its agricultural value depends mainly on the quantities of ammonia, soluble and insoluble phosphates, and alkaline salts, such analyses as those above given are sufficient for practical purposes, and they are easily made.

As good Peruvian G. sold long at from \$55 to \$65, and latterly at about \$70 per ton, there was a strong induce-

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ment to adulterate it. Umber, powdered stones, various earths, partially decomposed sawdust, and other substances, were used for this purpose, and quantities have been sold containing mere traces of the genuine article. Hence it is expedient that large purchasers should either send a sample to a good chemist for analysis, or should cork up and retain a small quantity in a bottle for analysis, provided the crops to which the G. has been applied do not meet reasonable expectation. A chemist is attached to many agricultural societies and clubs, who performs such analyses for a moderate fee. The frequency of analysis in England has largely checked adulteration there. Such facilities for analysis will largely supersede the following old and useful yet simple modes of testing the quality of guano.

1. *Test by Drying.*—If the G., as is generally the case with the Peruvian and Chili varieties, is a uniform powder, weigh out two ounces, spread it on paper, and let it lie two days in a dry and moderately warm room. What it may then have lost in weight must be esteemed superfluous water. Many sorts of G. are so moist as to lose 20 or 25 per cent. of their weight by this gentle drying. If we wish to determine the water with greater accuracy, a smaller quantity of G. should be placed in a shallow platinum capsule, and moistened with a few drops of hydrochloric acid. A heat of 212° may then be applied without loss of ammonia.

2. *Test by Combustion.*—Pour half an ounce of the G. into an iron ladle, such as is used for casting bullets, and place it on red-hot coals, until nothing but a white or grayish ash is left, which must be weighed after cooling. The best sorts of Peruvian G. do not yield more than 30 or 33 per cent. of ash, while inferior varieties, such as Patagonian, Chili, and African, leave a residue of 60, or even 80 per cent.; and those which are intentionally adulterated, may leave still larger residue. Genuine G. of all kinds yields a white or gray ash; and a yellow or reddish ash indicates adulteration with earthy matter, sand, etc. This test is based on the fact that the most important ingredients, viz., the nitrogenous compounds, become volatilized, and escape, when subjected to sufficient heat. The difference of odor of the vapors evolved in the process, according as we are working with first or third rate G., also must be noticed. The vapors from the better kinds have a pungent smell like spirits of hartshorn, with a peculiar piquancy somewhat like that of rich old decayed cheese; while those rising from inferior varieties smell like singed horn-shavings or hair.

3. The *Lime test* affords a ready means of roughly determining the relative quantities of ammonia in different specimens. Put a teaspoonful of each kind of G., and an equal quantity of slaked lime, into a wine-glass; then add two or three teaspoonfuls of water, and mix the substances together with a glass rod. Lime being a stronger base than ammonia, liberates the latter from the ammonia salts contained in the G.; and the better the G. is, the stronger will be the pungent ammoniacal odor which escapes from the mixture. The slaked lime should be preserved in a dry and well-corked bottle, to exclude the air.

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4. The *Hot-water test* affords a simple means of determining the goodness of G. We may either boil half an ounce of dried G. in five or six ounces of water, and filter the solution while hot, or we may place the G. on a filter, and continue to pour boiling water over it, until the drops that come through the filter cease to yield any residue when heated to dryness on a glass slip held over the spirit-lamp. As a general rule, the larger the quantity of G. that is dissolved in hot water, the more ammonia salts does it contain, and the better it is. In the best or Peruvian G., the insoluble residue ranges from 50 to 55 per cent., while in inferior varieties it may amount to 80 or 90 per cent.

5. The *Acid test* serves to detect the chalk which occurs in the Kooria Moorina G., and is used as an adulteration for other varieties. Mix the powdered G. with a little water, and a little hydrochloric acid or strong vinegar. If chalk is present, effervescence from the liberation of carbonic acid occurs.

6. The *Weight* affords the easiest test for purity. According to Prof. Anderson, a bushel of pure Peruvian G. should weigh not more than 56 to 60 lbs.; but according to most authorities it should weigh almost exactly 70 lbs. If heavier than 73 lbs., it is adulterated with clay, marl, sand, or some other impurity.

If the value of a manure be calculated, as is done by Boussingault and other chemists, according to the amount of nitrogen which it contains, one ton of good Peruvian G. is equal to $33\frac{1}{2}$ tons of farmyard manure, 20 tons of horse-dung, $38\frac{1}{2}$ tons of cow-dung, $22\frac{1}{2}$ tons of pig-dung, or $14\frac{1}{2}$ tons of human excrement.

When we consider what G. is—the more or less decomposed excrement of fish-eating birds, consisting essentially of the ash constituents of the flesh of fish, together with ammonia salts—we need not wonder that its application to the land as a manure should so largely increase productivity; ‘for guano,’ says Liebig, ‘contains not only the mineral elements which a soil must possess to produce corn, but also in the ammonia an indispensable element of food which serves to quicken their action, and to shorten the time required for their assimilation. On many fields, the ammonia in the G. may, if the weather prove propitious, possibly effect the assimilation of double the ordinary quantity of these mineral constituents, and thus render the amount of produce yielded in one year equal to what would have been otherwise obtained in two years by these mineral matters alone.’

The introduction of G. into Europe and N. America as a manure is comparatively recent. In 1840, only 20 casks of it were imported into Britain; (1855) 305,061 tons; (1877) 152,989 tons; (1883) 74,221 tons; (1885) 25,258 tons.

Prior to the civil war the importation of G. into the United States, mainly for use in the southern states, reached 80,000 tons per annum. During the war there was no demand for it, and since 1865 the importations have not exceeded and seldom equalled the former average, only 30,798 tons being received 1870. The falling off is

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attributable to the discovery of G. deposits on the coast of S. Car. immediately after the war. These deposits were first mined under the name of phosphates. In 1872 the yield from this region was nearly 100,000 tons, and 1867-72 it aggregated 242,415 tons, market value \$1,700,000. Citizens of the United States 1856-59, discovered and began working 48 unclaimed islands covered with G. deposits, under an act of congress giving such discoverers and operators protection. The G. of S. Car. is treated with sulphuric acid before use. Another reason for the falling off in importations of G. is found in the large number of factories that have sprung up in the northern states for the manufacture of bone-dust fertilizers.

As the chemical composition of natural G. is known, an artificial G. may be readily compounded by admixture, in due proportions, of its constituents. The following mixture, recommended by Prof. Johnston, forms one of the best imitations, 132½ lbs. of it being equal in power to 1 cwt. of good Peruvian G.: Mix 78½ lbs. of bone-dust, 25 lbs. of sulphate of ammonia, 1½ lb of pearl-ash, 25 lbs. of common salt, and 2½ lbs. of dry sulphate of soda. All these materials, except the bone-ash, may be procured from any druggist.

G. has been largely used for all the cultivated crops on the farm, and is yet, as far as it can be procured. Being a high-priced, but concentrated and powerful fertilizer, in ordinary farm-management it is applied with more economical results to some crops than to others. On grasses proper, it is sown broadcast in early spring, when vegetation begins to start. At this time the roots take it up, and prevent it from being washed out of the soil. Clover, being a deep-rooted plant, is supposed by some to be dressed with it best in autumn, before vegetation is stopped for the season. The roots store up the active principles of the manure till spring, and the plants are in far more vigorous state for the summer growth. From two to three cwts. of guano per acre is the common allowance for grasses intended for hay, but the Italian variety of rye-grass will sometimes bear a large quantity with beneficial results. G. is rather too soluble to be applied to early autumn sown wheat. It both stimulates the plant too much before winter, and is apt to be partially washed out of the soil with the winter rains. In moist springs, when there are abundance of rains to wash it in, G. forms an admirable top-dressing for winter wheat. For spring sown wheat, and other cereals, no manure has more powerful effect. The closer that it is put to seed, the better. The common dressing is from three to four cwts. to the acre for cereals. It should be kept in mind, in regulating the quantity, that the stronger the land is, the larger the quantity that can be applied with profit. The same principle should be observed in its use for the turnip crop. As much as from four to six cwts. may sometimes be beneficially applied to early sown turnips on deep and able soils, while two to three cwts., when farmyard manure is given, will in general prove the most economical quantity. G. is apt to produce too much heat when applied in

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large quantities to late sown turnips, and to prevent the formation of bulbs. In such circumstances, phosphoric manures will often yield better crops at less expense. When G. is applied to beans or potatoes, they should be dressed also with farmyard manure. G. has not the power of sustaining the healthy growth of these plants on most soils without something else in addition.

GUANTANAMO, *Gwân-ta-nā'mō*: a town and bay on the S. coast of Cuba: 38 m. e. of Santiago. The town and fort from which the bay takes its name lies about 5 miles back from the coast. To the left of the entrance is a strip of low, swampy land, and on the right rises a range of steep, rocky hills. On these bluffs the Spaniards had thrown up earthworks and dug rough rifle pits commanding the entrance. On 1898, June 10, the U. S. cruiser *Marblehead* was sent to shell these works, and the following day the transport *Panther* took possession of the hill, and landed 600 marines at Caimanera. It was just outside of the bay that the U. S. war vessels tried to destroy the cables which extended from Guantanamo to Santiago and then to Spain. In 1903 the Cuban government ceded to the United States the bay and vicinity for a naval station.

GUAPEY, *gwá'pā*: river of S. America, rising in Bolivia, joining the Mamore on its way to the Amazon, after a winding course of 550 miles.

GUAPORE, *gwá-pō'rā*: river of S. America, rising in Brazil, and, after a course of 400 m., uniting with the Mamore to form the Madera, affluent of the Amazon.

GUARANA, n. *gwā-rā'nǎ*, or **GUARANA BREAD** [after a tribe of Indians so named]: the Brazilian cocoa of Brazil, a food prepared by the savages from the seeds of a plant supposed to belong to the genus *Paullinia* (nat. order *Sapindaceæ*), which has been called *P. sorbilis*. The dried seeds are powdered, mixed into a paste, rolled into cylindrical cakes, and dried. These are regarded as very efficacious in many disorders; they contain, besides other substances, some nutritious, a considerable quantity of a substance supposed identical with theine or caffeine, and named Guaranine. The Brazilians pound the Guarana Bread in water, sweeten it, and use it as a stomachic and febrifuge. It is also reputed aphrodisiac.—The genus *Paullinia*, contains several species remarkable for extremely poisonous properties. **GUARANINE**, *gwā'rā-nǎn*, a bitter crystalline matter found in guarana bread.

GUARANTEE, n. *gǎr'ǎn-tē'*, or **GUAR'ANTY**, n. *-ǎn-tī* [F. *garantir*, to warrant, to vouch; *garantie*, warranty—from mid. L. *warrantus*: It. *guarentia*, guarantee, surety]: engagement to be answerable for a payment, or for a performance of any duty, by another; the person or party who so makes himself answerable for another. **V.** to engage that certain stipulations shall be performed by another person; to undertake to secure to another; to make certain. **GUAR'-ANTEEING**, imp. **GUAR'ANTEED**, pp. *-tēd*. **GUAR'ANTOR**,

GUARAPO—GUARD.

n. *-tör*, one who guarantees: see **WARRANT**.—*Guaranty*, in Law, is a contract by which one person binds himself to pay a debt or do some act in case of the failure of some other person, whose debt or duty it is to do the thing guaranteed. The person so binding himself is generally called in England the surety, in Scotland the cautioner, in the United States frequently the guarantor; while the person primarily liable is called the principal. Thus, where A borrows money, and B joins as a party in a bill of exchange or a bond to secure the loan, B is a surety or guarantor. Where B guarantees that certain goods supplied to A shall be paid for, he is more usually styled a guarantor than a surety, but the liability is the same.

Such a contract must be in writing; a surety can be bound only by some writing signed by himself or his agent. Similarly with one making representations as to the character, ability, or dealings of another, with intent that the latter may obtain credit. In order to bind the surety, there must also be no deceit or misrepresentation as to the nature of the risk or as to the state of the accounts. If a guarantee is given to a firm, it is not binding after a change in the firm, unless the parties expressly stipulate to that effect. If the creditor discharge the principal, or even give time, by way of indulgence to him, the surety is released, for he is thereby put to a disadvantage. In general, the creditor can sue either the principal or the surety for the debt at his option. If the surety is obliged to pay the debt of his principal, he can sue the principal for the money so paid, and is entitled to have all the securities assigned to him, so as to enable him to do so more effectually.

GUARAPO, **n.** *gwă-ră'pō*: a name given by the negroes to sugar-cane wine—that is, the intoxicating liquor resulting from the spontaneous fermentation of the sap of the sugar-cane.

GUARD, **v.** *gárd* [**F.** *garder*, to keep: **It.** *guardare*, to look, to guard: **O.H.G.** *warten*, to watch over: **comp.** **Gael.** *gaird*, an arm, a hand]: to watch over; to protect; to defend; to keep in safety; to be cautious: **N.** defense; preservation or security against loss or injury; that which defends or protects; caution of expression; a body of men for defense or security; state of caution or vigilance; in *bot.*, applied to sister cells bounding a stoma, formed by bipartition of a mother cell; in *zool.*, the cylindrical fibrous sheath with which the internal chambered shell of a belemnite is protected; in *fencing*, a posture of defense; part of the hilt of a sword; in *mil.*, a body of men kept on a particular duty for a certain time, as guarding a gate, a barracks, etc.; in *OE.*, an ornamental lace or border. **GUARD'ING**, **imp.** **GUARDED**, **pp.** *gárd'éd*: **ADJ.** cautious; framed or uttered with caution. **GUARD'EDLY**, **ad.** *-lì*. **GUARD'EDNESS**, **n.** **GUARD'ER**, **n.** one who guards. **GUARD'FUL**, **a.** wary; cautious. **GUARD'IAN**, **n.** *-i-ăn* [**F.** *gardien*]: one who has the care or protection of any thing or person; in *law*, see below: **ADJ.** protecting. **GUARDIAN ANGEL** (see **ANGELS**). **GUARD'IANSHIP**, **n.** the office of a guardian. **GUARDAGE**, **n.** *gár'-*

GUARDAFUI—GUARDIAN.

dāj, in *OE.*, state of one who is under a guardian; state of wardship. GUAR'DANT, a. -*dānt*, in *OE.*, exercising the authority of a guardian; in *her.*, usually, GARDANT, having the face of the animal turned in the direction of the spectator: N. in *OE.*, a guardian; a protector. GUARD'-ABLE, a. -*ā-bl*, capable of being protected. GUARDS, n. plu. general name for the regiments of household troops (see below). LIFE GUARDS, cavalry of household troops; a body of select troops for the protection of a prince. GUARDS-MAN, *gārdz'mān*, a soldier of the Guards. ADVANCED-GUARD, or VANGUARD, a body of troops marching some distance in front of an army to prevent surprise, or to give notice of danger. DISMOUNTING GUARD, the act of coming off guard. MOUNTING GUARD, the act of going on guard. GUARD OF HONOR, a body of troops drawn up to receive eminent personages as a mark of respect. QUARTER-GUARD, the guard posted in front of a camp. REAR-GUARD, a body of troops that march behind an army for its protection against surprise, or posted in rear of a camp. GUARD-ROOM, a room for the accommodation of soldiers on guard. GUARD-SHIP, a vessel of war appointed for service in a harbor or river (see below). ON GUARD, acting or serving as a guard.—SYN. of 'guard, v.': to keep; watch; shield; secure; shelter; preserve.

GUARDAFUI, *gwār-dā-fwē'*, CAPE (anc. *Aromatum Promontorium*): the most eastern point of the African continent, the extremity of an immense promontory stretching seaward e.n.e., washed on the n.w. by the Gulf of Aden and on the s.e. by the Indian Ocean. The cape is in lat. 11° 50' n., long. 51° 20' east.

GUARDIA-GRELE, *gwār-dē-ā-grā'lā*: small and unimportant town of s. Italy, province of Chieti, 12 m. s.s.e. of the town of Chieti. Pop. 8,000.

GUARD'IAN, in Law: legal representative and custodier of the person or estate (or both) of an infant, i.e. one under the age of 21: various kinds are distinguished. (1) *Guardian by nature*, in the United States, the father, and on his death the mother, who has charge of the person and estate of all the children; (2) *guardian by nurture*, in England, first the father, then the mother, who has charge of the persons of all children, not heirs-apparent, till they reach the age of 14 years (obsolete in the United States); (3) *guardian in socage*, custodian of the person and land or estate of an infant under 14 years of age, usually a relative who could not inherit from the infant (superseded in the United States by [5]); (4) *guardian by estoppel*, one who illegally undertakes the management of an infant's property and receives its profits (see ESTOPPEL); (5) *guardian by chancery*, in England one appointed by the court of chancery to take charge of minors and their estates. In the United States this G. is appointed by courts of equity and probate or surrogate courts; (6) *guardian by statute*, one appointed by deed or will of infant's parents or by a court in pursuance of a statute; (7) *guardian 'ad litem'*, person appointed by a court to protect an infant's interests in a suit in law;

GUARDS.

(8) *guardian by testament*, one appointed by the last will of a father, under the control of a court, removable for mismanagement, and responsible till the infant becomes of age.

In corresponding cases in Scotland, the custody of a child under 12, if female, or 14, if male, belongs to her or his tutor (q.v.): and from those ages to 21. the child has no legal guardian, being *sui juris*; but the care of the child's property belongs to a curator.

Guardian of the poor, is in English parochial law an important functionary, being a person elected by a parish or union of parishes to manage the affairs of the poor, acting in the place of the ancient parish overseers of the poor. Many large parishes are under a board of guardians, and all poor-law unions are managed by guardians.—In Scotland, the corresponding duties are discharged by the Parochial Board (q.v.), subject to the general board of supervision. See POOR.—As to guardian of a lunatic, see LUNATIC.

GUARDS: in all armies the élite of the troops, and usually those most heavily armed. In the British service, the G. constitute, in time of peace, the garrison of London,



Royal Horse Guardsman (1742).

and the guard of the sovereign at Windsor. The G. compose what is called the Household Brigade, and include in cavalry the 1st and 2d Life G., and the Royal Horse G. (blue); and in infantry, the Grenadier G., the Coldstream G., and the Scots G. (formerly Scots Fusilier G.). These corps comprise 1,300 cavalry in three regiments, and about 6,000 infantry in seven battalions

GUARDSHIP—GUARINO.

GUARDSHIP: the ship-of-war in charge of a port; generally also a dépôt for seamen gathered there until appropriated to other vessels; and her captain is responsible for the safety and proper preservation of the men-of-war which may be laid up—out of commission in the harbor. The superintendent of a dock-yard, if a flag-officer, carries his flag at the mast-head of the G.; if he be only a cap., the G. is usually under his nominal command, though the actual duties are in the hands of the commander or next senior officer.

GUAREA, *gwā'rē-a*: genus of tropical American trees of nat. ord. *Meliaceæ*, of some of which the bark is used as an emetic and purgative. *G. grandifolia* is called MUSK-WOOD in some islands of the W. Indies; the bark smelling so strongly of musk, that it may be used as a perfume.

GUARINI, *gwā-rē'nē*, GIOVANNI BATTISTA: 1537, Dec. 10—1612; b. Ferrara: Italian poet. He studied in the universities of Pisa, Padua, and Ferrara, and was appointed to the chair of literature in the latter, and soon published some sonnets which obtained great popularity. At the age of 30, he accepted service at the court of Ferrara, and was intrusted by Duke Alfonso II. with various diplomatic missions. He withdrew from the court about 1587. Having resided successively in Savoy, Mantua, Florence, and Urbino, he returned to his native Ferrara. He died at Venice, whither he had been summoned to attend a lawsuit. An irascible sensitiveness, joined to an exaggerated estimate of his personal dignity, neutralized many qualities both brilliant and solid, which seemed to fit G. exactly for a court career. To these defects, in part, may be attributed the frequent mortifications which tracked him through life. As a poet, he is remarkable for refined grace of language and sweetness of sentiment, while his defects are occasional artificiality, a too constant recurrence of antithetical imagery, and an affected dallying with his ideas. His chief work, *Il Pastor Fido* (The Faithful Swain), is regarded in Italy as a standard of elegant pastoral composition. The writer designed it as a tragio-comic pastoral; its first dramatic representation was in honor of the nuptials of the Duke of Savoy and Catherine of Austria, 1585. It ran through 40 editions during G.'s life, and was translated into almost all the modern languages. Its superb and perfect diction is flooded with sensuousness, and with a wanton love whose immodest expression is dangerously veiled with perfect rhetorical artifice and moving always within the limits of decorum. Cardinal Bellarmine told G. that he had done more harm to Christendom by his blandishments in poetry than Luther by his heresies in theology. Tasso and G. (Tasso's birth was seven years after that of G.) have been frequently compared; the two poets were literary friends and reciprocal admirers, though rivals in love. G.'s varied writings, including sonnets, comedies, satires, and political treatises, were published at Ferrara 1737, 4 vols. 4to—See *Storia della Letteratura Italiana del Tiraboschi*.

GUARINO, *gwā-rē'nō*, or **GUARINUS**, *gwā-re'nūa* [Lat.

GUARISH—GUATEMALA.

Varinus): a learned Italian: 1370–1460, Dec. 14; b. Verona. He went to Constantinople 1388 to learn Greek under Chrysoloras. After his return he taught in Verona, Padua, and Bologna, was tutor to Prince Lionella of Ferrara, acted as interpreter at the council of Ferrara, and died at Ferrara. He rendered great services in the revival of classical studies; translated the first ten books of Strabo, and a portion of Plutarch; commented on Cicero, Persius, Juvenal, Martial, and Aristotle; and wrote a *Compendium Grammaticæ Græcæ*, printed at Ferrara 1509. — Compare Rosmini, *Vita e Disciplina di Guarino* (3 vols. Brescia 1805–6.

GUARISH, v. *gär'ish* or *gär'ish* [F. *guérissant*, healing — from *guérir*, to heal]: in *OE.*, to heal. GUAR'ISHING, imp. GUARISHED, pp. *gär'isht* or *gär'isht*.

GUARNERI, *gwär-när'rē*, or GUARNERIUS, *gwär-när'rē-ūs*: family of noted violin makers of Cremona: including (1) ANDREA G., b. 1630, worked 1650–95, pupil of Nicolo Amati, instruments inscribed *Andreas Guarnerius fecit Cremonæ sub titulo Sanctæ Teresæ*; (2) PIETRO G., worked in Cremona and Mantua 1690–1725, instruments inscribed with his name and that of both cities; (3) GIUSEPPE ANTONIO G., nephew of Andrea G., 1683–1745, worked 1725–45, pupil of Stradivarius, best known of the family, instruments inscribed *Giuseppe Guarnerius, Andreae Nepos, I. H. S.*, whence he was known in Italy as *Guarneri del Gesù*.

GUASTALLA, *gwäs-täl'lá*: town of Italy, province of Reggio, at the junction of the Crostolo and Po rivers, 24 m. n.e. of Parma. It is the see of a Rom. Cath. bp., contains a cathedral, ruined 16th c., castle, 8 churches, hospital, gymnasium, public library, school of music, theatre, and statue of Ferrante I. of Gonzaga, and has manufactories of silk, flannel, and linen. G. was founded by the Lombards in the 7th c., became a fief of the German empire, was created a duchy 1621, given to the Duke of Parma 1748 and by Napoleon to his sister Pauline 1805, allotted to Maria Theresa 1815, ceded to Modena 1847, and incorporated with Italy 1860. Pop. 10,618.

GUATEMALA, *gaw-tē-má'la*, Sp. *grá-tā-má'lá* (rarely GAUTIMALA): nominally a republic, really an oligarchic state of Central America, forming the n.w. portion of Central America, being washed at once by the Caribbean Sea and the Pacific Ocean. It stretches in n. lat. from about 14° to 17°, and in w. long. from 88° to 93°; 40,000–50,000 sq. m. (the frontiers are not settled, and surveys are imperfect). The surface presents great variety, mountains and valleys, plains and table-lands. The different levels, ranging from the sea-shore to an extreme elevation of about 8,000 ft., have each its own climate and temperature. Mountain-peaks are numerous; more than 30 volcanic summits are reported. The chief mountain range is generally parallel to the Pacific coast, 49 or 50 m. distant; its highest peaks rise above 13,000 ft.; its mean elevation is 7,000 ft. There are many navigable rivers, and some large lakes. The climate is in general healthful. The country is subject to earthquakes, and abounds in active volcanoes. G.

GUATEMALA—GUATEMOZIN.

contains many ruins of an ancient and extended civilization.

Being nearly as populous as all the other states of Central America put together, G. popularly gave name, in the early days of independence, to the confederation which those states temporarily formed 1824; and, from the same pre-eminence, it had given name, under the Spanish domination, to a still more extensive region. The government is in the hands of a pres. elected for four years, with a council of state and a house of representatives. Formerly, the pres. was elected for life, and under Rafael Carrera 1854-65 the government was in the interest of a dissolute aristocracy and a debased priesthood. Now a different order prevails. A new code of laws has been drawn up; the monastic order has been wholly suppressed; and, though the Rom. Cath. is the established religion, others are tolerated. 1889, Jan. 1, the national debt was, foreign \$4,485,780, domestic consolidated \$4,592,700, floating \$1,744,740, total \$10,823,220. The revenue 1888 was \$3,288,106, imports \$5,042,395, exports \$7,715,344, import duties collected \$2,288,385, exports to the United States \$1,877,038, imports from the United States \$967,240. Of the total imports 33 per cent. were from England, 22 from U. S., 21 from Germany. 1889, Sep., a contract was signed for the construction of a northern rr., which will be united to the G. Central. In 1901 the debt was £1,690,392; revenue £3,241,885; trade with the U. S. and England amounted to, imports, £518,365; exports £913,657. Pop. (1900) 1,647,300.

GUATEMALA, Old: city in Guatemala, Central America, at the foot of Volcan d'Agua; lat. 14° 30' n., and long. 90° 45' w. Formerly cap. of the country, and one of the richest and most beautiful cities of Spanish America (pop. more than 60,000), it was twice destroyed, 1541 by an eruption, and 1773 by an earthquake. Though, after the second disaster, it was supplanted by its more modern namesake, yet it was, to a certain extent, rebuilt. It is frequently called Antigua (Old). Many of its ancient buildings, especially a cathedral and a palace, remain entire. Pop. abt. 20,000.

GUATEMALA, or **SANTIAGO DE G.**, *sân-tê-á'gô dâ*, or **G. LE NUEVA**, *lâ nô-á'vá* (the New). capital of the republic of G.; founded 1775, in a rich and spacious table-land, 4,961 ft. above the sea; lat. 14° 37' n., and long. 90° 30' west. It is 24 m. e.n.e. of the original cap, G. Antigua. The people manufacture muslins, cotton-yarn, plate, artificial flowers, and beautiful embroidery, carrying on at the same time a prosperous trade in the agricultural productions of the neighborhood. The place is well supplied with water by an aqueduct. It is sometimes called the Paris of Central America. Pop. (1890) 65,796; (1898) 74,000.

GUATEMOZIN, *gwâ-tê-mō'zîn* or *gwâ-tâ-mō-sên'*: last Aztec emperor: about 1495-1525, Feb. 15; b. Mexico. He was nephew and son-in-law of Montezuma, and became emperor on the death of Montezuma's brother 1520. He immediately took vigorous measures to continue the de-

GUAVA.

fense of Mexico City against the Spanish attacks begun during the reign of his predecessor, and when his preparations were nearly completed Cortes, and his army appeared before the capital 1521, Apr. 28, and laid siege to it. The Mexicans held out till famine and pestilence compelled their surrender. G. was urged by his people to flee for safety, and after many entreaties attempted to escape, but was pursued and captured near Lake Tezcuco. For some time he was treated considerably by Cortes, but when the Spaniards failed to find as much booty as they had expected he was unavailingly subjected to torture. He lived in the capital in semi-liberty till 1524, when Cortes took him on his expedition for the conquest of Honduras. In the following winter he was falsely accused of plotting to kill Cortes and other chiefs, and after a brief investigation was put to death.

GUAVA, n. *gwá'vǎ* [Sp. *guayaba*], (*Psidium*): genus of trees and shrubs of nat. ord. *Myrtaceæ*, mostly natives of tropical America, some of them yielding valued fruits. They have opposite entire, or almost entire leaves, a 3—5 lobed calyx, 4—5-petals, and 1—5-celled berry with many-seeded cells. —The COMMON G. or WHITE G. (*P. pyriferum*),



Guava (*Psidium pyriferum*).
a, section of fruit.

(variety of the species *P. Guayaba*, which produces most of the G. fruits of commerce), is a low tree of 7—20 ft., with numerous branches, obtuse smooth leaves 2—3 inches long, and fragrant white flowers on solitary axillary stalks. It is said to be a native both of the E. and of the W. Indies, and is now much cultivated in both. It was probably introduced into the E. Indies from America, but has now become fully naturalized. Sir James E. Tennent says, it is to be seen in the jungle around every cottage in Ceylon. The fruit is larger than a hen's egg, roundish or oblong,

GUAXACO—GUAYAQUIL.

smooth, yellow; the rind thin and brittle; the pulp firm, full of bony seeds, flesh-colored, aromatic, and sweet. The jelly or preserve made from it is highly esteemed, and is now regularly exported from the W. Indies and S. America. The rind is stewed with milk, and is also made into marmalade. This fruit is rather astringent than laxative. G. buds, boiled with barley and liquorice, make a useful astringent drink in diarrhœa.—The RED G. (*P. pomiferum*), also now common in the E. as well as in the W. Indies, produces a beautiful fruit, with red flesh, but not nearly so agreeable as the white guava. It is very acid. The CHINA G. (*P. Cattleyanum*), native of China, is a larger tree than the white guava: the fruit is round, about the size of a walnut, of a fine claret color, growing in the axils of the leaves; the pulp purplish red next the skin, becoming paler toward the centre, and there white, soft, subacid, and of very agreeable flavor. It makes an excellent preserve. It thrives in the open air in s. France.—On some of the mountains of Brazil grows a dwarf species of G., called Marangaba (*P. pygmaeum*), a shrub 1—2 ft. high, with fruit about the size of a gooseberry, much sought on account of its delicious flavor, resembling that of the strawberry.—The BASTARD G. of the W. Indies is a species of *Eugenia* (q. v.).

GUAXACO: see OAJACO.

GUAYAQUIL: river in Ecuador, the only stream on the w. coast of S. America which can, without qualification, be said to be navigable for sea going vessels. It is navigable for about 110 m. to Caracol, and is known in its upper course successively as the Caracol and Babahoya.

GUAYAQUIL, *gwî-â-kêl*: department in Ecuador, extending from the Pacific on the w. to the departments of Quito and Assuay on the e., comprising a much wider belt of low and level land than is generally found further s. between the Andes and the sea.

GUAYAQUIL BAY: bay on the coast of Ecuador, which receives the G. river; in s. lat. between 2° and 4°, and in w. long. between 80° and 81°. It receives also the Daule and the Tumbez.

GUAYAQUIL, or SANTIAGO DE GUAYAQUIL: city, cap. of the dept. of G.; principal seaport of Ecuador; on the right bank of the river G., 40 m. from its mouth. It is divided into two parts, the old and the new. The houses are mostly of wood; the principal buildings are the cathedral, the two hospitals, and the two colleges, the last of which have faculties of theology, philosophy, and law. G. possesses the best, perhaps the only really good harbor on the Pacific shores of S. America, the naturally deep channel being aided by a tide which sometime rises and falls 24 ft. Occupying a low level site, and being in lat. 2° 11' s., the place is necessarily unhealthy. Recently, however, the town has been drained, and the river dredged, and good water has been introduced. It has an extensive trade. Over half of the total foreign commerce of Ecuador centering here. The city contains a college and

GUAYRA—GUDGEON.

is the see of a bishop. The chief articles of imports are cottons (more than a quarter of the whole), woollens, wines, spirits, grocery, soap, etc., metals, flour, and linens, and of exports, cocoa straw-hats, timber, bark, hides, orchilla, tobacco, sarsaparilla, canes, india-rubber, coffee, and precious metals. Pop. about 51,000, mainly mulattoes, mestizos, and Indians.

GUAYRA, LA or **LA GUAIRA**, *gwīrā*: principal seaport of Venezuela, S. America; on a narrow strip of land between the mountains and the sea, about 5 m. from Caracas, of which it is the port. The town is strongly fortified. The harbor is an open roadstead of the Caribbean Sea, and the anchorage is unsafe; but the trade of the port, which is entered annually by about 200 vessels, is extensive. The chief exports are copper ore, cocoa, dye-woods; coffee, formerly the most important, has of late declined. The principal imports are woollens, calicoes, guns, cutlery, and chinaware from Great Britain; wines from France and Germany; flour, wheat, petroleum, machinery, and cotton goods from the United States. Pop. abt. 7,000.

GUBBIO, *gób'bc-ō* (ancient *Iguvium* or *Eugubium*): interesting city in central Italy, beautifully situated on the s.w. declivity of the Apennines, in the province of Urbino, about 27 m. s. of the city of Urbino. It contains several fine public edifices. On the most elevated point of the city, where the ancient fortress stood, is the ducal palace, so called from having been erected and inhabited by the Dukes of Urbino, who also governed Gubbio. The municipal palace is a noble old pile of building, erected 1332 by Matteo di Giannello, native architect. In the palaces Brancalone and Beni are valuable pictures, collections of Etruscan, and other antiquities. G. possesses several fine churches, and some excellent public establishments for sanitary and educational purposes. The most important ancient remains are the ruins of a theatre, supposed to have been destroyed by the Longobards, a temple of Mars, and an Etruscan sepulchre of great antiquity. At a short distance are the ruins of the famous temple of Jupiter Apenninus; here, 1444, were discovered the famous Euginine Tables (q.v.). Pop. 5,350.

GU' BEN, *gō'bén*: manufacturing town and river-port of Prussia, province of Brandenburg; charmingly situated on the Neisse—the banks of which are here planted with vines—at its confluence with the Lubst, 28 m. s.s.e of Frankfort. Except its gymnasium, it has no notable buildings. The principal manufactures are woolen goods and tobacco. The red wine produced here is esteemed one of the finest in the eastern portion of the kingdom. Pop. (1880) 25,840; (1885) 27,086; (1890) 29,420.

GUBERNATORIAL, a. *gū'bér-nā-tō'rī-āl* [fr. L. *gubernator*, pilot]: of or pertaining to a governor or his office.

GUDDI, or **GUDDEE**, n. *gū'd'dē*: see **GADDEE**.

GUDGEON, n. *gū'j'ūn*: iron pin or shaft on which a wheel turns.

GUDG'EON (*Gobio*): genus of fishes of the family *Cyprini*.

GUDIN—GUEBRES.

G., having a short dorsal fin, a short anal fin, and no strong serrated ray in either, the body covered with rather large scales, and barbules at the angles of the mouth. The Common G. (*G. fluviatilis*), is abundant in many rivers of Europe and Asia that have gravelly bottoms, and occasional pools and rapids. It seldom exceeds eight inches in length; the depth is not one-fifth of the length. The tail is forked. The eye is high on the side of the head. The upper parts are olive brown, spotted with black; the under parts white. Gudgeons swim in shoals. They feed on worms, mollusks, and other small animals, and are extremely ready to bite at a bait, commonly a small piece of a red worm. The G. is esteemed for the table. Many are taken with casting-nets in shallow water, and kept in well-boats till wanted. Fishmongers sometimes keep them in tanks, constantly supplied with fresh cold water. They thrive well in ponds supplied with fresh water by brooks. In fishing for these fish, a small hook and a light float are required. Neatness in baiting is not necessary, for the same bait, without much alteration, will often take ten or a dozen gudgeons in succession. No art is required in the angling. The bait should drag or trip along the bottom; but if the angler will, with a large rake, disturb the gravel at the bottom, and rake a clear bright spot, a yard in width, and two or three in length, the gudgeons, attracted by the dislodged particles, will swarm up to the spot seeking food, and they can be taken rapidly by the dozens.

GUDIN, *gü-däng'*, JEAN-ANTOINE-THÉODORE: French landscape and marine painter; b. Paris, 1802, Aug. 15. He studied some time under Girodet-Trioson, but soon abandoned the style of that artist, and ranked himself with the Romanticists, on the side of Géricault and Delacroix. He first attracted notice by his picture, *Brick en Détresse*, 1822. Most of his marine pictures appeared at the Paris Exhibition 1855. G. painted 1838–48 more than 80 such pieces for the Museum of Versailles. Since 1855 he has exhibited many new paintings.

GUEBRES, *gā'bērz* or *gē'bērz*, or GHEBRES, or GHEBERS, *gā'bērz*, or GABRES, or GHAVRES (Turk *Ghiaur* or *Ghaur*): followers of the ancient Persian religion as reformed and consolidated by Zerdusht (Zoroaster). This name, Guebres (compare GIAOUR), commonly, but against all linguistic laws, derived from the Arabic *Kaf'ir* (a word applied to all non-Mohammedans, and supposed to have been bestowed on this sect first by their Arabic conquerors in the 7th c.), is evidently an ancient proper name of some pre-eminent tribe or locality, since the Talmud (Jebam. 63 b., Gitt. 17 a. etc.) knew them only by this name (Cheber); and Origen (*Contra Cels.* vi. 291) speaks of Kabirs or Persians, asserting that Christianity has adopted nothing from them. They are also called *Atesh Perest*, or fire-worshippers; *Par-sees*, or people of Pars or Fars—i.e., Persia; *Madjoos*, from their priests the Magi; and by themselves *Beh-Din*, 'Those of the excellent belief'; or *Mazdaasnan*, worshippers of Ormuzd. For the origin, nature, and early history of

GUEBWILLER—GUELFs AND Ghibellines.

this religion, see ZOROASTER: ZEND-AVESTA: SUN-WORSHIP. When the Persian empire became subject to the Mohammedan rule, the great mass, of the inhabitants were converted to the religion of Islam. A very small number still clinging to the ancient religion, fled into the wilderness of Khorassan, or the island of Hormuz; but even this remnant was for many centuries under constant oppression. Mahmoud the Ghiznevide, Shah Abbas, and others, are conspicuous for untiring persecution of them; and the manner in which they were held up to general detestation is best shown by the position assigned them in most popular Mohammedan tales as sorcerers and criminals. At present there are, according to the latest native information, about 8,000 Guebres scattered over the vast dominions of their ancestors, chiefly in Yezd and 24 surrounding villages. There are a few at Teheran, a few at Ispahan, at Shiraz, and some at Baku, near the great naphtha mountain, but all plunged in the depths of ignorance, and, with very few exceptions, of poverty. They have a high reputation for honor, probity, obedience to the law, chastity, and endurance. Another portion, after various migrations—which are told at length in the *Kissah-i-Sanjan*, written by Behram (1599)—reached India, where they are now settled under the name of Parsees, chiefly in Bombay: they are very numerous, forming a population of more than 50,000, or about 8 per cent. of the whole population: see PARSEES.

GUEBWILLER, *gheb-vêl-lär'* (Ger. *Gebweiler*): town in the province of Alsace-Lorraine, 15 m. s.s.w. of Colmar. There are manufactures of ribbons, cloths, nails, sugar, and machinery. Pop. (1880) 12,452.

GUELFs AND Ghibellines, *gwëlf's*, *gīb'ël-līnz*, It. *ghē'bël-lēnz* (often GUELPHs and Ghibellines): names of two great parties, the record of whose conflicts may be said to be almost the history of Italy and Germany from the 11th to the 14th c. The origin of these names was formerly a subject of speculation; but antiquaries are now agreed in tracing them respectively to the two families, Waiblingen and Welf, which, in the 12th c., were at the head of two rival parties in the German empire, and whose feuds came to be identified historically with the respective principles for which these parties contended. Welf was a personal name of a pre-historic founder of the family still represented under the name of Guelph in the royal (English) and ducal houses of Brunswick; Waiblingen, a small town in Würtemberg, was a possession of the house of Hohenstaufen. The assumption of the names as party names is usually assigned to the great battle of Weinsberg, Suabia, 1140, in which Emperor Conrad of Hohenstaufen (Duke of Franconia), and Welf, uncle of Henry the Lion, Duke of Saxony, rallied their followers by the respective war-cries, 'Hie Waiblingen!' 'Hie Welf!' As the chief theatre of the conflict of these parties was Italy, the original names took the Italian form of *Guelfi* and *Ghibellini*. The Ghibellini may, in general, be described as supporters of the imperial authority in Italy: the Guelfi, as opponents of

GUELDERLAND—GUELDER-ROSE.

the emperors; and as the opposition to imperial authority in Italy combined two distinct parties in a common cause—the church, which asserted its own spiritual independence, and the minor principalities and free cities, which maintained their provincial or municipal rights and liberties—the history of the struggle is involved in confusion, and is variously related, and its merits variously appreciated, from differing points of view. To the churchman, it is the struggle of the church against the state; to the friend of popular principles, it is the conflict of liberty against absolutism and centralization. The same individual—e.g., the poet Dante—is found changing sides in the struggle. For the most part, however, the interest of the church in these mediæval contests, though regarded by Protestants as excessive in degree, must be classed as falling in with the claims of political and personal freedom. Five great crises in the strife of the G. and G. are noted by historians: under Henry IV., 1055; under Henry the Proud, 1127; under Henry the Lion, 1140; under Frederick Barbarossa, 1159, and in the pontificate of the great champion of churchmanship, Innocent III. The cities of northern Italy were divided between the two parties—Florence, Bologna, Milan, and other cities, as a general rule, taking the side of the Guelphs; while Pisa, Verona, and Arezzo, were Ghibe line. The great Italian families, in like manner, took opposite sides; but the policy of each family frequently varied from one generation to another. In general, it may be said that the nobles of the more northern provinces of Italy inclined to the Ghibelline side, while those of the central and southern provinces were Guelph. By degrees, however, especially after the downfall of the preponderance of the German emperors in Italy, the contest ceased to be a strife of principles, and degenerated into a mere struggle of rival factions, availing themselves of the prestige of ancient names and traditional or hereditary prejudices. Even in 1272, Gregory X. could with truth reproach the Italians with their sanguinary animosities for the sake of what were but names, the meaning of which few of them could understand or explain; and, in the following century, in 1334, Benedict XII. practically disallows altogether the reality of the grounds of division between the parties, by prescribing, under pain of the censures of the church, the further use of those once-stirring names, which had long been the rallying words of a sanguinary warfare. From the 14th c. we read little more of Guelphs or Ghibellines, as actually existing parties; but in the sense already explained, the conflict of principles which they represent is found in every period of political history.

GUELDERLAND: see GELDERLAND.

GUELDER-ROSE, n. *gël'dër-rōz*, or GUELDRES ROSE [from *Gelderland*, in Holland; L. *rosa*, a rose]: cultivated variety of the Water-Elder (*Viburnum Opulus*—see VIBURNUM), in which the flowers are all barren, and instead of forming flat cymes, as in the wild plant, form much larger globose corymbs. It is sometimes called the SNOW-BALL

GUELPH—GUERCINO.

TREE, also Marsh Elder. It bears juicy red berries, which though sometimes eaten in n. Europe, have emetic, purgative, and narcotic properties verging on the poisonous. When abounding in flowers, it is a very ornamental shrub, and is often planted.

GUELPH, *gwělf*: city, cap. of Wellington co., Ontario, Canada; on Speed river and the Grand Trunk railway, and the Buffalo and G. branch of the Great Western railway; 47 m. w. by s. of Toronto. Speed river, a branch of the Grand, is navigable to G., which is in a rich agricultural region. The city contains flour, saw, and woolen-mills; breweries, tanneries, sewing-machine, agricultural implement, and several choice building stone quarries. Pop. (1871) 6,878; (1901) 11,496.

GUELPHIC ORDER, *gwělf'ik*: order of knighthood for Hanover, instituted 1815, Aug. 12, by George IV., when prince regent. It is both a military and civil order, unlimited in number; and consisted originally of three classes—Knights Grand Cross, Commanders, and Knights—to which the revised statutes of 1841 have added another class of simple members. The Grand Mastership is vested in the crown of Hanover. The badge of the order is a gold cross, surmounted by the Hanoverian crown—between each division of the cross is a lion passant gardant. In the centre is the horse courant of Hanover, surrounded by a blue circle, and the motto, *Nec aspera terrent*.

GUELPHS: see GUELFs AND GHIBELLINES.

GUERARA, *gā-rā'rā*, or **GERRARA**: town of Algeria, district of the Beni-M'zab, on the left bank of a river called the Zigrhir or Zegerin, lat. 32° 45' n., long. 5° e., about 40 m. n.e. of Ghardaia. It is walled, has three gates, and is a favorite commercial rendezvous for all the neighboring tribes, who frequent G. for purchase or disposal of horses, asses, sheep, ivory, gold-dust, ostrich feathers, cotton, silk, cutlery, etc. The market is supplied chiefly from Tunis and Algiers. Pop. about 12,000.

GUERCINO, *gwě'r-chě'no* ('squint-eyed'), properly **GIAN-FRANCESCO BARBIERI**: celebrated master in the Bolognese school of painting: 1590–1666; b. Cento, a pretty town not far from Bologna. G. early showed artistic gift by sketching with the roughest materials on the house-door a Virgin so full of artistic promise, that his father, in spite of straitened circumstances, immediately secured for him the best tuition in drawing which the place afforded. In 1616 G. opened an academy at Cento, to which pupils flocked from all quarters. 1619–23 he visited different cities of Italy, particularly Rome and Venice, to study works of eminent painters. In 1642 he went to live at Bologna, where he died. Some of the early paintings of G. show his admiration of Caravaggio's style, both in their powerful effects of deep coloring and strong fidelity to nature, while they much surpass those of the great realist in dignity and refinement of tone. They are deficient, however in accuracy of design. His works, which are very numerous, are in the galleries of Rome, Bologna, Parma, Modena, Perugia, and

GUERDON—GUÉRIN.

Paris. His master-pieces are considered to be the fresco of *Aurora*, which decorates the ceiling of one of the casinos of the Roman villa Ludovisi; the famous *Persian Sibyl*, and *Saint Petronilla*, both in the Capitoline Gallery at Rome. At Cento, the artist's house, *Casa di Guercino*, is carefully preserved, with its fine paintings and fresco decorations, and is the chief object of interest to those who visit the place. The church of Cento, also contains several fine works of this master, who had an intense love for his birth-place.

GUERDON, n. *gér'dōn* [OF. *guerdon*; It. *guiderdone*, a reward—from mid. L. *widērdōnūm*—from O.H.G. *wider*, against, back again; L. *dōnūm*, a gift]: reward; recompense: V. to reward. **GUER'DONING**, imp. **GUER'DONED**, pp. *-dōnd*. **GUER'DONABLE**, a. *-ā-bl*, worthy of reward.

GUERICKE, *gēr'ik-kēh* or *gār'ik-kēh*, OTTO VON: 1602, Nov. 20—1686, May 11; b. Magdeburg, Prussian Saxony: physicist. He is known chiefly by his discoveries regarding the nature and effects of air. The experiments of Galileo and Pascal on the weight of air led G. to attempt the creation of a vacuum. His first experiment was made by filling a stout barrel with water, and then pumping out the water; but it was found that no sooner was a vacuum produced in the barrel than the air forced its way through. He now took a globe of copper, with an opening at the bottom into which a pump was fitted, provided with a stopcock, and to his astonishment found that the pump extracted the air quite as well as the water; then, on opening the cock, the air was heard rushing in with a whistling noise. This, the first air-pump, was invented about 1650. G.'s invention soon became famous, and in 1654 he was summoned to the presence of Emperor Ferdinand III. of Germany at Ratisbon, at which time he made the famous experiment commonly known as the Magdeburg Hemispheres (q.v.). He died at Hamburg.

GUERRILLA, n. *gēr-īl'lā* or *gwēr-īl'lā* [Sp. *guerrilla*, a war of partisans—dim. of *guerra*, war]: one of an irregular force employed in small bands to harass an army, particularly in a mountainous country: **ALS.** pert. to irregular warfare; carried on by independent bands. The term Guerillas was applied first in Spain to armed bands of peasants and shepherds carrying on an irregular warfare on their own account. They were regularly organized (1808-14) against the French, and being favored by the character of the country, were often successful, especially at the commencement of the war, under Empecinado, the Pastor Merino, Mila, and other leaders. The country itself suffered from the guerillas, who revenged political treachery, or even the bare suspicion of it, by fearful devastations. Many of them, particularly Mina's band, joined Wellington's force, and after a course of discipline, rendered good service as regular troops. In all the recent civil wars of Spain, the guerillas, especially of the Basque provinces, were prominent on the Carlist side.

GUÉRIN, *gā rāng'*, GEORGES MAURICE DE: 1810, Aug.

GUERIN—GUERRAZZI.

4—1839, July 19; b. Languedoc, France: poet. He was educated in a seminary at Toulouse, and Stanislas College, Paris, and then entered the religious soc. at La Chesnaye in Brittany preparatory to an ecclesiastical career. Here he gave more thought to poetry than theology, and though Bp. Lamennais induced him to join a new religious order 1833, Aug., his doubts as to his vocation became so strong that within two months he renounced his novitiate. In 1834 he went to Paris, and after working some time on the newspaper and magazine press, became a teacher in Stanislas College. His poems show rare power and large original talent, and were published in 2 vols. 1860.—His sister, EUGÉNIE DE G., 1805–1848, May 31, was a woman of devout religious life and superior education, who seemed to live only to care for her brother. Her *Journals* (1861, English tr. 1865) and *Lettres* (1864, English tr. 1865) are written in charming style, and show rare genius and religious fervor.

GUÉRIN, *gā-răng'*, PIERRE NARCISSE, Baron: 1774, May 13—1833, July 16; b. Paris: eminent historical painter of the French classic school. He attracted notice first by his *Corps de Brutus rapporté à Rome* (1796). Some of his works are master-pieces of the French classic school. The few portraits executed by G. are admirable. Among others may be mentioned one of Henri de la Roche-Jacquelin storming an intrenchment. In 1829 he was raised to the rank of baron. He died at Rome. Purity of design, dignity of style, taste in grouping, and harmony of color are generally conceded to G., but the coldness which marks the classic schools of painters is as visible in him as in others.

GUERITE, *gěr'it*, F. *gě-rēt'*: small loopholed turret in the wall of a fortress, from which a sentry may command a view and fire over the ditch.

GUERNSEY, *gěrn'zē*: second in size of the Channel Islands (q.v.); lat. 49° 24'—49° 30' n., and long. 2° 33'—2° 41' w.; 69 m. s.e. from Start Point, in the s. of Devonshire—nearest point of the English coast; about 46 m. s.w. from Cherbourg, France. Its length is 9 m., greatest breadth about 6 m., circumference 31 m. The coast is difficult of approach, owing to the number of rocks and the rapidity of currents. The n. part of the island is flat, the s. more elevated, but intersected by deep valleys and glens, and with a lofty and abrupt coast. St. Peter's, or St. Peter Port, on the s.e. coast is the only important town; pop. about 17,000. The island is populous and wealthy, has many strong defensive works. For particulars about climate, soil, productions, trade, etc., see JERSEY. Pop. with Herm and Jethou (1881) 32,659; (1901) 40,777.

GUERRAZZI, *gwěr-răt'sē*, FRANCESCO DOMENICO: 1804, Aug. 13—1873, Sep. 25; b. Leghorn: Italian statesman and writer. He was educated for the legal profession, won reputation among his countrymen by his political fictions, said to have had immense influence on contemporary Italian events by their patriotic enthusiasm and abhorrence

GUERRERO.

of despotism. G.'s own words are, 'he wrote a book when impotent to fight a battle.' On the eve of the definite breach between the people and the Grand Duke of Tuscany 1849 G. was induced to accept office in the ministry. On the flight of the grand duke, he was proclaimed member of the provisional government, and subsequently dictator. During this crisis of the state he energetically refused his adhesion to 'the substitution of republicanism for monarchy;' and preserved the strict autonomy of Tuscany until the return of the grand ducal rule, when he was immediately seized and imprisoned on the grounds of having neglected due measures of repression when the revolution first gathered strength during his ministry. His defense, entitled *Apologia della vita Politica di F. D. Guerrazzi*, or 'Justification of the Political Career of F. D. Guerrazzi,' is a master-piece. After an imprisonment of three years, he was condemned for life to the galleys, but was subsequently permitted to select Corsica as the place of his perpetual banishment. Restored to liberty and action by later events, G. sat in the parliament of Turin 1862 and 65.—His chief works of fiction are *L'Assedio di Firenze* (The Siege of Florence), a magnificent historical novel, treating of the downfall of the republic of Florence; *La Battaglia di Benevento*, remarkable for exquisite expression and beautiful poetic imagery; *Beatrice Cenci*; *Isabella Orsini*; *L'Asino*; and various other writings, which have run through innumerable editions and translations.

GUERRERO, *ghĕr-ră'rō*: state in the republic of Mexico; bounded by the Pacific Ocean and the states of Michoacan, Marelos, Mexico, Puebla, and Oajaca; 24,544 sq. m.; cap. Chilpancingo. It is wild and mountainous in the n., well watered, with deep valleys and large tracts of primitive forests in the s., has a rich soil, and is sparsely settled. Organized 1849; pop. (1900) 474,594.—GUERRERO is the chief town of the state of G. (formerly the cap. and known as Tixtla), 150 m. s.w. of Mexico city, at an elevation of 5,000 ft. It has a few simple manufactures, and has almost entirely lost its formerly large silver-mining interests. Pop. 6,500.

GUERRERO, VICENTE, President of Mexico: 1783—1831, Feb. 14; b. Tixtla. He was born a slave of mixed negro and Spanish blood, was active in the insurrection 1809, a leader in the battle of Izucar 1812, Feb. 23, gained several victories over the Spaniards in the s. of Mexico, continued to resist the Spaniards after the death or imprisonment of all the other native leaders till his great victory of Tamo 1818, Sep. 15, then joined Iturbide in a movement for national independence. After Iturbide was proclaimed emperor, G. opposed him and was defeated in the battle of Almolonga 1823, Jan. 23, but on the return of the republicans to power he became a member of the executive council that exiled the emperor. In 1827 he was defeated as the candidate of the liberal party for pres., but at the close of the civil war that followed he was declared pres. as a compromise 1829. On the return of the Spanish

GUESCLIN—GUESS.

troops he was proclaimed dictator and defeated the invaders. He resigned 1830, went s., made an unsuccessful attempt at revolution, was captured, and shot at Cailapa.

GUESCLIN, *gā-klīng'*, BERTRAND DU, Count of Longueville, Constable of France: most eminent French general of the 14th c.: b. of an ancient family in the dist. of Rennes, between 1314 and 20; d. 1380, July 3. As a boy, he was remarkably dull, and could not be taught either to read or write, but had a passion for military exercises. In his 17th year he bore away the prize at a tournament at Rennes, and from that time was always successful in such encounters. In the contests between Charles de Blois and Jean de Montfort for the dukedom of Brittany, he took part with the former. After King John had been taken prisoner by the Black Prince at the battle of Poitiers 1356, G. rendered important services to the Dauphin, afterward Charles V. He took Melun and several other fortified towns, freed the Seine from the English, and on Charles's accession to the throne 1364, was created gov. of Pontorson. In May of the same year he gained the battle of Cocherel, and was rewarded by the title Count of Longueville and Marshal of Normandy. On Sep. 29 he was defeated and taken prisoner by the English, under Sir John Chandos, at the battle of Auray, but liberated on payment of a ransom of 100,000 livres, paid by the king, the pope, and several other princes. He now supported Henry, Count of Trastamare, against Pedro the Cruel, King of Castile, but was defeated and taken prisoner by the Black Prince. Being again ransomed on payment of a large sum, to which even the enemy contributed from feelings of respect, G. renewed the contest, and 1369 defeated and slew Pedro, and placed the crown of Castile on the head of Henry of Trastamare. As an acknowledgment of his services, Henry created G. Count of Burgos, Duke of Molina, and Constable of Castile. He was, however, soon recalled by Charles V. of France, at that time hard pressed by the English, and raised by that monarch to the dignity of Constable of France. In 1370, G. opened his campaigns against the English, and in a short time the whole of their possessions were in the hands of the French, with the exception of a few fortified towns. While assisting his friend Sancerre in the siege of Châteauneuf de Randon, in Languedoc, G. was taken ill, and died. Charles V. caused him to be interred with great pomp beside his own burial vault at St. Denys.—Compare Guyard de Berville, *Histoire de Bertrand du Guesclin* (Paris 1767).

GUESS, n. *gēs* [Dut. *ghissen*, to estimate, to guess: Icel. *giska*; Norw. *gissa*; Dan. *gisse*, to guess: comp. Gael. *gis*, to conjecture]: a conjecture; an opinion formed without certain knowledge: V. to conjecture; to suppose; to form an opinion without sufficient evidence; to decide from mere probabilities; to hit upon the truth. GUES'SING, imp.: N. the forming of conjectures. GUESSED, pp. *gèst*. GUES'SER, n. *-sēr*, one who. GUES'SINGLY, ad. *-lī*. GUESS-WORK, n. random or haphazard conjecture.—SYN. of

GUEST—GUGGENBÜHL.

'guess, n.': supposition; hypothesis; surmise; suspicion; thought; fancy; imagination; divination.

GUEST, n. *gäst* [Goth. *gasts*, a stranger: Ger. *gast*; Icel. *gestr*, a guest: W. *gwest*, a visit; *gwestai*, a visitor]: a stranger or friend entertained in the house of another; a visitor. **GUEST-CHAMBER**, the public room of the house; the apartment appropriated to guests. **GUEST-WISE**, in the manner of a guest.

GUEST, in Law: see **INN—INNKEEPER**.

GUEUX, *gûh*, or 'THE BEGGARS': name assumed by the confederated nobles and others who opposed the tyrannical policy of Philip II. of Spain in the Low Countries. Philip having sent nine inquisitors to that country to put into execution the decrees of the Council of Trent, provoked by this act the bitter resentment of the Protestants, as well as of many Rom. Cath. citizens and nobility, who saw in it an attempt to curtail their ancient liberties. A party of opposition was thus formed, and, headed by Counts Louis of Nassau and Henry de Brederode, declared in an act called the 'Compromise,' remitted (1566, Apr. 5) to the Regent Margaret, their fixed determination to ignore utterly the authority of the inquisitors. On the admission of a deputation from them to an audience, the regent seemed somewhat unnerved by their bold front, and inclined to yield to their demands; when one of her council approached her, and whispered that she 'need not be afraid of these gatherings of beggars.' The remark having been overheard by some of the deputation, the abusive epithet was assumed as the title of their association. As a sign of fraternity, each of the 'beggars' wore a medal called the 'beggar's denier,' made of gold or silver, and stamped on the obverse with the image of Philip II. and the inscription, 'In everything faithful to the king;' and on the reverse with a wallet, such as the mendicant monks carried, held in two hands, with the words, 'even to the carrying of the wallet.' The 'beggars' maintained a long and vigorous contest against the despotic proceedings of Philip and his advisers, but were ultimately compelled to succumb to superior force. A branch of them, 'the Beggars of the Sea,' under the bold leadership of the savage Count de la Marck, were almost uniformly successful in their enterprises: they several times defeated the Spanish fleet, captured transports with supplies for Alva's army, captured several fortresses, and succored besieged places along the coast.

GUEVEI: see **KLEENE BOG**.

GUFFAW, n. *gûf-faw* [Scot. *guffa*, or *gu fà*; Gael. *gu fad*, lengthily, with length]: a long boisterous laugh; a loud burst of laughter.

GUFFER, n. *gûf-fër*: one of the names for the viviparous blenny; other common names are 'eel-pout, tanglake, and greenbone.'

GUGGENBÜHL, *góg'gên-bühl*, LOUIS, M.D.: 1816-1863, Feb. 2; b. Zurich, Switzerland: philanthropist. He gradu-

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ated in medicine 1836, spent three years studying the epidemic idiocy that has long prevailed in the deep Alpine valleys of Italy and Switzerland as well as in the Pyrenees and Himalayas, bought a mountain (Abendberg) near Interlaken 1841, and in the following year opened a retreat for this particular class of idiots (cretins), which became the model for many similar institutions elsewhere.

GUGLIELMI, *gól-yèl'mē*, PIETRO: 1727, May—1804, Nov. 19; b. Massa di Carrara: musician and composer. From his father, *Maestro di Cappella*, in the ducal chapel of Modena, he acquired the elements of music. His first opera, composed at the age of 28, was performed at Turin, and was greeted with enthusiasm. After a residence of some months at Dresden, Vienna, and various other towns, G. passed over to London, where he remained five years, assiduously engaged in composition. At the age of 50 he returned to Naples with the double prestige of great fame and wealth. In 1793, Pope Pius VI. appointed him *Maestro di Cappella* at St. Peter's, and from that time his official duties seem completely to have engrossed him. He died at Rome. The characteristics of his style are pre-eminently simplicity, purity, and precision, and these qualities he inexorably demanded from the exponents of his inspiration—'Sing *my* music and not *yours*!' His best known operas are—*La Clemenza di Tito*; *Artaserse*; *La Didone*; *Enea e Lavinia*; *La Morte di Oloferne*; *Debora e Sisera*; and the comic operas *La Virtuosa di Mergellina*; *I due Gemelle*; *La Serva Innamorata*; *La Pastorella Nobile*; *La Bella Pescatrice*.

GUIANA.

GUIANA, *ghē-ā'nā*, BRITISH (Fr. *Guyane*, Sp. *Guayana*, Port. *Guianna*): portion of the extensive tract forming the n.e. part of S. America; lat. $8^{\circ} 40' \text{ n}$ — $3^{\circ} 30' \text{ s}$, and long. 50° — 68° w . The greatest length of this tract, from Cape North to the confluence of the river Xie with the river Negro, is calculated at 1,090 m.; its greatest breadth, between Punta Barima, at the embouchure of the river Orinoco, and the confluence of the river Negro with the river Amazon, at 710 m. It is at present politically divided into Venezuelan, British, Dutch, French, and Brazilian Guiana. The name G. is usually supposed to have been applied by the Dutch to the whole country from the name of a small river Wai-ini, tributary of the Orinoco, on which stands a small town called Guayana Vicija.

The limits of the British possessions have never been accurately determined. Approved authorities assign to them all the regions drained by the waters falling into the river Essequibo; and as the river Corentyn is the acknowledged line between British and Dutch G., the area, on this basis, may be stated at 76,000 sq. m., a territory much larger than England and Wales. But if the claims of the Venezuelan and Brazilian governments respectively are admitted, the British portion will be reduced to something above 12,000 m., smallest of European colonies in this region.

The coast-line of the British territory consists of an alluvial flat, with rich and highly productive soil. This fertile coast 10 to 40 m. wide, is bounded by a range of low sand-hills. A peculiar feature of the interior is the savannas extending between the rivers Demerara and Corentyn, and at the river Berbice closely approaching the sea-shore. There is another series of savannas further inland, and the geological structure of the regions indicates that it was once the bed of an inland lake, which, by some great elemental disturbance, burst its barriers, and forced for its waters a passage to the Atlantic. This supposition may throw light upon the origin of the tradition of the White Sea and the city of the gold besprinkled Manoa, which inflamed the ardor of the chivalric Raleigh, and led him to the pursuit of those discoveries by which his name has been immortalized.

The fluvial system of British G. consists mainly of four great and seven smaller streams, the whole of the first named and six of the latter pouring their waters directly into the Atlantic. The four great rivers are the Essequibo (q.v.), the Demerara (q.v.), the Berbice (q.v.), and the Corentyn (q.v.). In the Kaieteur falls, the Potaro passes by a leap of 830 ft. into the Essequibo.

Climate.—The climate is genial and equable, and for a tropical country comparatively healthful. The thermometer ranges from 90 to 75° F ., the mean temperature $81^{\circ} 226$. The barometric pressure—highest, 30.05 in. ; lowest 29.74 , mean, 29.916 ; average rainfall at Georgetown, 100.50 in.

History—Whether Christopher Columbus himself ever actually landed on the shores of G. is not known; but it is certain that the Spaniards must have settled in the neighboring countries early in the 16th c., as in 1580, when the

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Dutch began to establish themselves on the banks of the Pomeroon and other rivers, they were speedily driven out by the Spaniards. nor was it until 1602 that they obtained a footing on the Essequibo. During the 17th and the early part of the 18th c., the Dutch were frequently harassed by incursions of the French and by internal insurrections: three distinct colonies were constituted, until, 1789, those of Essequibo and Demerara were united. Berbice remained a separate colony until 1831, when the three were constituted into the colony of British G., consisting of the counties of Demerara, Essequibo, and Berbice.

Toward the close of the 18th c., the feelings of the inhabitants had become strongly influenced by a desire to place themselves under British sovereignty, and in 1796 effect was given to that desire by the cession of the colonies to an expedition under Major-General Whyte. At the peace of Amiens, 1802, however, the colonies were restored to the then 'Batavian republic,' to be again surrendered to Great Britain 1803, which was finally confirmed at the peace of 1814.

Government—The political constitution of the colony has undergone little modification since its affairs were administered by the Dutch. It retains peculiarities which distinguish it from that of any other colonial dependency; the principal variations introduced have been the division of the colony into electoral districts; a new definition of the qualification for holding the electoral franchise, and open instead of secret voting. The electors return members of two distinct bodies; these bodies are small in membership, and limited in their power being largely under the control of the governor. The direct responsibility of the governor to the crown for any and all of his acts, has been found in practice an ample safeguard against any abuse of this large prerogative. The judicial system of the colony long continued as it was established by the Dutch; and the Roman code is still the basis of the administration of justice in civil matters. Trial by jury in such cases, at the option of either party, was introduced 1844; and in criminal cases, trial by jury was established by law 1846, and the English criminal code was adopted as the law of the colony. There are supreme and inferior courts, presided over by judges; and police and stipendiary magistrates in each town and district. The stipendiary police consists of about 300 men, and there is a strong and trustworthy body of rural constables throughout the colony.

There are but two towns, properly so called—Georgetown (q.v.) and New Amsterdam (q.v.).

The cultivated region is confined to the sea-coast, and to short distance up the rivers Berbice and Demerara. The estates were laid out by the Dutch in the general shape of a parallelogram, and the staples were sugar, rum, and molasses, cotton and coffee. In 1747, two schooners sufficed to carry to Europe the crop of 550 half-hogsheads of sugar: in 1752, the culture of cotton and coffee began. Immediately after the conquest by the British 1796, great impetus

was given to agriculture; since that period the fluctuations have been considerable, and there has been a gradual decrease of the numbers of estates in cultivation. In 1831, there were 322 altogether; 30 years later there were not more than 160. Cotton and coffee have ceased to be exported; the former is not cultivated, the latter to a very small extent. All available resources have been concentrated on the production of sugar and rum; there is diminished quantity of molasses, owing to improvement in the manufacture of sugar. The produce of many estates has been increased 50 to 100 per cent. The timber-trade has become important, mainly as a result of the interest excited in the natural resources of G. by the Great Exhibitions at London 1851, and Paris 1855 and 78.

For ecclesiastical purposes, the colony is divided into 17 parishes, of which seven belong exclusively to the Church of Scotland, and eight exclusively to the Church of England, while Georgetown, in Demerara, and New Amsterdam, in Berbice, have ministers of each church. The ministers of both churches, with those of the Rom. Cath. Church and of the Wesleyans, are maintained by salaries from the colonial treasury, secured by law for a term of years. There are also independent missionaries scattered throughout the colony, supported exclusively by the voluntary contributions of their flocks. In 1874, the charge for religion amounted to nearly £20,000; and public education cost a nearly equal sum. The educational system, formerly denominational, was made colonial 1877.

This important dependency, like the other sugar-producing colonies of Great Britain, has had to struggle against great difficulties—arising partly from imperial legislation; and it has still to contend with an expensive system of recruiting the deficient labor-market from distant regions.

The statistics of the years 1870 and 1880 show the progress of the colony. In 1870, the revenue was £354,130; the expenditure, £335,185; in 1880 they were respectively £603,790, 2s. 5d., and £404,460. The public debt decreased from £582,420 to £367,730. Tonnage of vessels entered and cleared in 1870, 409,365 tons; in 1880, 516,375. In 1870, the imports were valued at £1,897,000; in 1880, £2,002,700. In 1901 the imports were £1,414,769; exports £1,833,624. Sugar is the chief export, and had (1901) a value of £1,038,163. Trade in valuable native woods—chiefly greenheart—enlarged greatly. The imports consist mainly of flour, dried salt fish, rice, malt liquor, brandy, machinery, oils, lumber, pork, and manufactured goods. There are 130 sugar estates in the alluvial coast region, 70 plaintain (provision) estates, 80 cattle farms, about 20 coffee and 10 cocoa-nut estates. The criminal statistics for 1877 show a large amount of crime; out of a population of 228,880, there were 33,049 apprehensions and summonses. Pop. (1891) 287,981, inclusive of aborigines and troops in garrison. Increase since 1851 is due to immigration: the Creole population has receded—a matter of serious concern. The population is diversified; the aboriginal Indians rapidly becoming extinct—7,000 to 10,000

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within the British territory; the Creole negro; the mixed race; the immigrants from Madeira, from the E. Indies, and from China; with a sprinkling of Europeans, chiefly British, French, and Dutch. A valuable contribution to our knowledge of the natives is *Among the Indians of Guiana*, by Im Thurn (1883). The immigrants (1870-80) numbered from 4,000 to 6,000 per annum, mostly from Calcutta. About 35,000 oriental Indian-coolies were indentured in the colony.

GUIA'NA, DUTCH; or SURINAM, *sô-rî-nâm'*: region in South America between British and French Guiana, separated from the former on the w. by the Corentyn, while the Marony separates it on the e. from the territories of the latter. It is bounded n. by the Atlantic, and s. by the Acarai mountain-range, which divides it from Brazil; lat. 2° — 6° n., long. about 53° —about 57° w.; 46,000 sq. m., nearly four times the area of the Netherlands. Only a small part has been explored; and only about 30,000 acres (about 300 plantations) are cultivated.

Although the physical character, climate, and productions are very nearly the same as those of British Guiana (q.v.), the natural advantages of the colony are not so fully developed, and in the hilly districts in the interior and south, which are held by the Maroons or runaway slaves, the lands are wholly uncultivated. The rivers all fall into the Atlantic; the most considerable is the Surinam, which has a course of nearly 300 m., but is navigable for large ships only a few m. above Paramaribo (q.v.), the capital, which is about 10 m. from its mouth. The Marony, forming the e. boundary of the colony, has a longer course (400 m.); but though 4 m. wide at the mouth, is barred by sand-banks. The Corentyn, on the w. frontier, is almost as long; and the Saramaca is the next most important. Much of the area is covered with primeval forests of magnificent and valuable timber. For the climate, see PARAMARIBO.

The principal exports are sugar (by far the most important), cocoa, cotton, coffee, rum, molasses, quassia, and other valuable woods, gums, and drugs. Total annual value of exports (1898-1901) varied from \$2,084,450 to \$2,146,224; of the imports, from about \$2,117,768 to \$2,811,112. Great Britain receives most of the exports. In 1874, the gold-diggings of Surinam attracted notice, but now there are valuable gold-diggings in several of the river-basins. The revenue (1902) was about \$921,000; expenditure, about \$1,040,400;

The govt. is administered by a gov-gen., nominated by the king of the Netherlands; and a council of 9 to 13 members, partly named by the gov-gen. and partly elected. The slaves were emancipated 1863, July 1; a compensation of abt. \$122 being given for each slave.

The Dutch, who were the first European settlers in Guiana, organized trading stations on the coast as early as 1580, and till 1790, when Demerara and Essequibo fell into the hands of the English, they retained possession of most of Guiana. The present limits of Dutch G. were settled by the Congress of Vienna. Pop. (1900) 68,968, exclusive

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of the bush-negroes or Maroons—i.e., negroes who escaped during slavery times and subsequently asserted their independence—and some Indians, and excluding the garrison and sailors.

GUIANA, FRENCH (sometimes called CAYENNE): region in S. America, including districts lying between 2° and 6° n. lat. and $51\frac{1}{2}^{\circ}$ and $54\frac{1}{2}^{\circ}$ w. long.; bounded n. by the Atlantic; w. by the Marony river, which separates it from Dutch Guiana, and by the little-known districts beyond the Rio-Branco; and s. and e. by the river Oyapock and the range of the Tamucumaque Mts., which separate it from the republic of Brazil. The area, according to the provisionally accepted boundary, is 31,000 sq. m., but the boundary-line of French G. is not well defined, and has long been a subject of discussion with the Brazilian and Dutch governments. In addition to the continental districts, French G. comprises several islands near the coast, the principal of which are Cayenne, in which is the capital of the same name, Le Grand Connétable, and Le Petit Connétable. The country is divided into high-lands and low-lands, the former of which commence at the first cataracts of the rivers, and gradually increase in height toward the central districts, which they traverse in a granite mountain range, nowhere higher than 1,600 ft. The low, alluvial lands, from the cataracts to the Atlantic, are mostly covered with vast forests, but the soil is well adapted to the cultivation of grain of every kind, and of all the tropical products. Among the 20 navigable streams or rivers, the principal are the Marony, to the w., and the Oyapock to the e. of Cayenne; but navigation is difficult by reason of numerous cataracts and rapids. They are, however, united by numerous navigable cross channels. The overflowing of the rivers gives rise at various points in lower French Guiana to swamps or marshy savannas, covered with forests of mango-trees and palms; while in other parts lakes are formed, the most extensive of which are those of Mapeucu, Macari, and Mapa.—The rainy season lasts with short intermissions from Nov. to June; and the heat is less oppressive than in most places in the W. Indies, in consequence of the trade-winds, which bring the temperate moisture of the Atlantic. The thermometer seldom rises above 90° or falls below 75° . The chief products and exports are choice woods for ornamental purposes, rice, maize, coffee, cacao, sugar, cotton, nutmeg, cloves, and pepper.

French G. was occupied first by France 1633. It is divided into 14 communes comprised under the two cantons or districts of Cayenne and Sinnamary, under a gov. assisted by a privy council. French budget (1903) stood charged with sum of a little less \$1,303,000 for ordinary expenses of govt. in Guiana, and less than \$1,139,000 for the penal settlements of Cayenne. The administration of justice is centered in the tribunal or imperial court at Cayenne, the chief town of the province; and is under the jurisdiction of a president, assisted by counsel, auditors, and notaries. There are 9 free elementary schools in the colony giving instruction to 1,100 children, under the management

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of the clergy of the Rom. Cath. church, of which the majority of the population are members, though various forms of faith are tolerated, and supported at the charge of the state.

In accordance with an imperial decree 1854, Guiana has been made the principal seat of the penal settlements of France, which are maintained at Cayenne at the national charge. All persons sentenced to eight years' hard labor, are condemned at the expiration of their sentence, to reside for the remainder of their lives in the colony, unless when they are specially pardoned, in which case they are seldom allowed to return to France. Grants of lands with the restitution of civil rights, may be accorded by the local authorities as a recompense for good conduct; but the discipline is in all cases severe, and the labor heavy and continuous. The mortality of the prisoners is believed to be very great, but the French govt. does not include the death-rate of G. in its otherwise very full tables of mortality. Pop. of French G. (1886) 26,905; (1889) 25,600; (1901) 32,908.

GUIA'NA BARK, FRENCH: bark of *Portlandia hexandra*, called also *Couteria speciosa*, a tree of nat. ord. *Cinchonaceæ*, with opposite ovate leaves, and corymbs of very large purple flowers; native of Guiana. The bark is esteemed a very powerful febrifuge, and the value of the widely known medicine, called *Warburg's Fever Drops*, is believed to depend mainly upon it.

GUIB, *gwīb* (or HARNESSSED) ANTELOPE: antelope of a dull red color, so peculiarly striped with white as to give it the semblance of being in harness. Immense herds of it are seen in w. Africa.

GUIBERT, *ghe-bär'*, JOSEPH HIPPOLYTE, Cardinal Archbishop of Paris: 1802, Dec. 13—1886, July; b. Aix-en-Provence, France. He entered the order of Oblates of Mary Immaculate at Marseilles, and finished his theol. studies at Rome. After being vicar-gen. and superior of the Seminary of Ajaccio, he was appointed bp. of Viviers 1841, promoted abp. of Tours 1857, translated to the see of Paris in succession to Mgr. Darboy 1871, and created cardinal-abp. 1873. He had been an officer of the Legion of Honor since 1859.

GUICCIARDINI, *gw-t-châr-dē'nē*, FRANCESCO: 1483—1540; b. Florence; of noble parentage: Italian statesman and historian. He early studied law and literature, and before the age of 23, he was elected prof. of law by the Signoria of Florence, and had a reputation for great skill as a legal practitioner. G. was ambitious, and his knowledge of international law, and tact in the conduct of public affairs, caused him to be selected 1512, by the Signoria, as ambassador to the court of Ferdinand, King of Aragon. Returning to Florence after two years, he was received with every mark of public approval, and 1525 was despatched by the republic to receive at Cortona Pope Leo X. This sharp-sighted pontiff at once secured G.'s services, and committed to him the government of Modena and Reggio, and finally of Parma. Clement VII. continued to shower dignities on G., and appointed him,

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with unlimited powers, gov. of the Romagna, and finally of Bologna. On the accession of Paul III., G. resigned all his dignities, and after 18 years of papal service, returned to Florence, where Alexander de' Medici had just been thrust on the citizens as their sovereign by Charles V. On the assassination of Alexander, G. promoted materially the elevation of Cosmo de' Medici; but meeting with no special favor from that prince, he withdrew from Florence to his villa at Arcetri, where he commenced his famous work, *La Storia d'Italia*. He died before its completion. 21 years after his death, the first 16 books of his history were published, and three years later, four additional books appeared. The work is considered a standard of classical historical writing, independent of its value as a minute and faithful record of the period it embraces, 1490-1534. A magnificent Italian edition was published at Freyburg 1775-6, four vols. 4to, strictly in accordance with the manuscripts deposited in the Magliabecchi library at Florence; another was published at Pisa, 1819, 10 vols. 8vo, edited by Rosini. 1857-67, appeared at Florence *Opere inedite di Francesco Guicciardini*, comprising a series of aphorisms and discourses on the Florentine Institutions, in the form of dialogue, recovered from the mss. in the family archives. His works reveal a cold, sordid, selfish, passionate nature, with wonderful powers of analysis and observation, which found a fitting sphere in the social and political decrepitude of Italy in that age. He was of Macchiavellian stamp, only at a lower moral grade. His *Politici Recordi* has been pronounced by a great Italian critic, 'Italian corruption codified.' G.'s outward conduct was singularly correct.

GUICCIOLI, *gwīt-chō-lē* or *gwīt'cho-lē*, TERESA GAMBA, Countess: 1801-1873, Mar. 26; b. Romagna, Italy: known in connection with Lord Byron. When 16 years old she married Count G., wealthy nobleman of Ravenna, 50 years older than herself, and two years afterward attracted the attention of Lord Byron while visiting Ravenna, and till 1822 was his inseparable companion. In 1851 she married the Marquis de Boissy, a French senator and peer, and 1869 published *My Recollections of Lord Byron and those of Eye Witnesses of his Life*.

GUICOWAR, *ghī'ko-wār*, or 'the Herdsman': designation of a powerful Mahratta prince, whose dominions at the present time include most of Guzerat (q.v.), with Baroda for capital. The G., originally, as the name denotes, was an officer in the establishment of the rajahs of Satara, supreme rulers of the Mahrattas (q.v.), and after a time rose high in rank by his military services, being ultimately appointed hereditary second in command of the Mahratta armies. Pelajee, who became G. 1721, by predatory excursions gradually acquired authority over Guzerat; and his son Damajee, who succeeded 1732, extended the bounds of this ample dominion. Damajee then threw off his allegiance to the Peishwa, but being taken prisoner by treachery, he was compelled to yield one-half of his dominions, and do homage for the other half. Annund Rao, who ascend-

ed the throne 1800, was the first prince of the line who had intercourse with the British Indian govt., and the relations of the British with these Mahratta princes since have been friendly. The G. agreed by treaty to disband his Arab soldiers, and receive a British subsidiary force 1802; and a treaty of general defensive alliance was concluded 1805, by which a British subsidiary force is maintained by the G. Syajee Rao, who became G. 1819, was frequently reprimanded by the British govt., and in 1838 part of his state was sequestrated. In 1840 he made his submission, and among other concessions abolished Sutte. His successor, Mulhar Rao, was accused of attempting to poison Col. Phayre, British resident, and tried before a commission which disagreed about his guilt; but he was deposed for his general misrule, and Gopal Rao, a prince of the Candesh line, was appointed his successor. See BARODA.

GUIDE, *n.* *gīd* [F. *guider*; It *guidare*, to show, to direct]: the person or thing that directs; one who leads; a regulator: V. to lead or direct; to influence; to instruct; to superintend. GUIDABLE, *a.* *-dā-bl*, capable of being guided. GUIDING, *imp.* *gī'ding*. GUIDED, *pp* GUIDANCE, *n.* *-dāns*, a leading; direction; government. GUIDELESS, *a.* *-lēs*, having no guide. GUIDE-POST, a post at a cross-road, directing the traveller which road to follow. GUIDER, *n.* one who, or that which. GUIDE BOOK, a book for tourists or visitors, containing directions how to visit certain districts or localities, what to see, and where, with useful information in regard to them; an elementary treatise.—SYN. of 'guide, v.': to conduct; direct; pilot; manage; regulate; order; instruct; train; govern.

GUIDES, in Military Affairs: usually persons drawn from the country in which an army is encamped. A sufficient body of intelligent G. is collected at headquarters, to enable one or more to be sent with every detachment of troops which leave the camp. A guide should be quick of eye, experienced in the topography of the country, and, above all, faithful. As guides must mostly be drawn from a hostile population, and have probably only a pecuniary interest in serving well, their conduct is always watched with utmost jealousy, death being the punishment for the least lack of trustworthiness.—In the French army a considerable corps of cavalry and infantry bear the name 'Guides,' [contr. from *guidons*—see GUIDON], so named because they carry the principal guidon or standard. They were formed 1744, as a small company of messengers on active service. The number was gradually increased until Napoleon I. formed them into a guard 10,000 strong.

GUIDO, *groē'do* or *gō-ē'do*, ALESSANDRO: 1650–1712; b. Pavia: Italian poet. His first pieces drew the notice of the king of Pavia, whose favor he further secured by setting his verses to spirited airs of his own composition. In 1685, with the sanction of the duke, he went to Rome, where his kind patron assigned him apartments in the Farnese palace. He obtained the friendship also of Christina, Queen of Sweden, and composed, at her desire, the pastoral

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drama of *Endimione*, the princess condescending to be his fellow-laborer in the work. He died at Frascati, of apoplexy brought on by his discovery of a typographical error in a superbly printed copy of poems which he was on his way to present to Pope Clement XI. G. was squint-eyed and hump-backed. The dramas of G. fail in sweetness and affection, but are interesting and elevated in sentiment. As a lyrical poet, G. ranks very high.

GUIDO ARETINO, *gwē'do*, or *gô-ē'do*, *â-râ-tē'no* (named from his birth-place, Arezzo): monk of the Benedictine order: b. prob. in the last decade of the 10th c.; d. 1050, May 17. He has the reputation of being the inventor of musical notation, and the regenerator of music. He was the first who systematically used the lines and intervals of the musical staff, and he is credited with the introduction of the F clef. The circumstances which led to G.'s invention are differently stated; but the most probable account seems to be, that on one occasion while chanting with the monastery choir (of Pomposa) a hymn in honor of St. John, he was struck with the gradual and regularly ascending tones of the opening syllabic sounds of each hemistich, in the three first verses:

Ut queant laxis
Mi-ra gestorum
Sol-ve polluti

re-sonare fibris
fa-muli tuorum
la-bii reatum, etc.

With the intuitive foresight of genius, he instantly, we are told, comprehended the fitness of these sounds to form a new and perfect system of solfeggio, and forthwith proceeded to mature and systematize this idea. On introducing his new theory into practice among the youthful choristers of the monastery, the experiment proved entirely successful: envy and jealousy, however, were the reward of his innovation. The fame of G.'s musical invention drew to him the attention of the pope (John XX.), who invited him to Rome. G. went thither, and obtained a gratifying reception. The pope himself found pleasure in becoming a student of the new system, under the guidance of its founder and teacher. Ill health, due to the insalubrious air of Rome, compelled G. to return to the bracing climate of his birth-place. G. has left some interesting writings, explanatory of his musical doctrines viz., the *Micrologus*; and the *Argumentum Novi Cantus inveniendi*.

GUIDO DE BRES, *gwē'dō dēh brā*: 1540-67; b. Mons, Belgium: author of the *Belgic Confession*. He was brought up in the Rom. Cath. Church, converted to Protestantism, forced by religious persecution to leave his native city, joined a Walloon congregation and became a preacher in London, returned to Flanders and founded the first evangelical congregation at Lille 1563, fled to Geneva 1566, became a disciple of Calvin, formed congregations at Tournay, Lille, and Valenciennes, and at the storming of the latter was captured and hanged. *His Confession of Faith of the Reformed Church in the Netherlands* was prepared 1559, and after Calvin's approval, published 1562.

GUIDON, n. *gī'dūn*, in F. *gē'dōng* [F.—from *guider*, to

GUIDO RENI—GUILANDINA.

guide]: the silk standard or flag of a regiment or squadron of light cavalry, broad at one end and nearly pointed at the other; a small flag or streamer.

GUIDO RENI, *gwě'do rā'nē*: 1575, Nov. 4—1642, Aug. 18; b. Bologna: celebrated painter of the Bolognese school. At first he aimed at the sombre coarse strength of Caravaggio's creations; later he followed the more refined and ideal school of the Caracci; and finally struck out a style for himself. His works are extremely numerous, and the majority reflect a fervent spiritualism, more characteristic of the devotion of the early Bolognese school, than of the later spirit infused by the Caracci, founders of the modern standard of Bolognese art. G. was unhappily an infatuated gambler, and with the view of replenishing his often-squandered finances, produced with extreme rapidity many inferior works undeserving his name. Among his best productions are *The Crucifixion of St. Peter*, a magnificent work in the Vatican Museum; the *Crucifixion*, in the church of St. Lorenzo, in Lucina, Rome. The famous portrait long assumed to be that of Beatrice Cenci is probably not from his hand: many other works seem to have been falsely attributed to him. The *Aurora*, of G., on the roof of one of the halls of the Rospigliosi Palace, a fresco of world-wide fame, is considered the greatest of his works.

GUIENNE, *gē-ě'n'*: one of the 32 provinces into which France, previous to the Revolution, was divided. It comprehended the territory now formed by the depts. of Gironde, Lot, Dordogne, Aveyron and portions of Tarn-et-Garonne, and Lot-et-Garonne, and formed with Gascony (q.v.) what was originally the country of Aquitania, of which name G. is a corruption. For its earlier history, see **AQUITANIA**.

GUIGNES, *gēñ*, **JOSEPH DE**: 1721, Oct. 19—1800, Mar. 19; b. Pontoise: French orientalist. He was appointed interpreter for oriental languages in the Bibliothèque du Roi, and died at Paris. His great work is *L'Histoire Générale des Huns, Turcs, Mogols, et autres Tartares occidentaux, avant et depuis J. C. jusqu'à présent* (Paris 1756-58).—His son **CHRÉTIEN-LOUIS-JOSEPH G.** (1759-1845, b. Paris), was a distinguished oriental scholar, and published a Chinese Dictionary (Paris 1813), by the orders of Napoleon I.

GUIJAR, or **GUIXAR**, *gē-čhâr'*: lake of Central America, in the n.w. of the state of San Salvador; 60 m. in circumference, inclosing a large island, which abounds in game, and contains the ruins of what was evidently a large town.

GUILANDINA, *gī-lăn-dī'na*: genus of shrubs of nat. ord. *Leguminosæ* sub-ord. *Cæsalpinieæ*, having pinnate leaves, and remarkable for the stony hardness of their seeds, the coating of which is so silicious that they are said even to strike fire with flint. The seeds are used for beads and for children's marbles. *G. Bonduc* is the best known species, and is of very wide geographic distribution, though, like the rest of the species, growing only in warm

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parts of the world. It is called the *Bondwe*, and the *Nicker Tree*, and its seeds, often cast ashore on the coasts of Scotland and Ireland, are called *Molucca Beans*. The cotyledons are very bitter, and are much used in India for cure of intermittent fevers.

GUILD, n. *gild* [Dan. *gilde*; Low Ger. *gilde*, a feast, a contributory company (OE. *gild* or *geld*, a set payment—from *zeldan* or *zyldan*, to pay—whence also the present *yield*), a corporation: IceL. *gildi*, payment, a guild: W. *gwyb*; Bret. *gouil*, a feast]: a society; a corporation; a confraternity. **GUILDRY**, n. *gild'ri*, the members of a guild. **DEAN OF GUILD COURT**: see **DEAN**.—Guilds were originally associations of the inhabitants of particular towns, for promoting the common interest of the fraternity. They are said to be of Saxon origin, but unquestionably similar institutions existed at a very early period among the southern nations of Europe, where they were known by the name of Confraternities. In England, there were guilds during the Saxon rule, and several records are preserved concerning them. The Saxon guilds appear to have resembled the modern friendly societies. On condition of a certain payment, the members were entitled to relief in case of sickness, and to protection from violence. At a later period, guilds were of two kinds, religious and secular. Both classes retained, as a general rule, the principle of mutual relief to members in sickness; but the former were established for works of charity, and regular observance of certain religious services; while the main object of the latter was the advancement of the commercial interests of the fraternity. In order to the establishment of a G. religious as well as secular, it was necessary that it should receive the sanction of the sovereign; and in the reign of Henry II. several guilds were subjected to heavy fines, as having been established without that authority. In London were many religious guilds. In the reign of Richard II., a G. to the honor of St George the martyr, consisting of an alderman, master, brothers, and sisters, was established in Norwich; and here, it may be observed in passing, that the term alderman was first a name for a chief officer or governor in a G. whence it was extended to an officer of a burgh on the extension of guilds, as noticed below. The above G. having been an orderly virtuous society for 30 years King Henry V. confirmed it by letters-patent under the Great Seal, made it perpetual, and granted it certain privileges and immunities (*Madox, Firma Burgi*). In like manner, guilds were formed in Bristol, Exeter, and other large towns. These guilds, through the munificence of individuals, by degrees amassed considerable wealth. By Henry VIII. the property and revenues of these religious guilds were seized and perpetually vested in the crown.

The most important branch of this subject is that of the secular guilds, styled in s. Europe, confraternities. These institutions were the germ of the modern burghs or municipal corporations. They consisted originally of the members of some particular trade, united for mutual assistance

GUILDER—GUILDFORD.

in sickness, and for maintaining the interests of the trade; e.g. the G. of goldsmiths, of weavers, of cordwainers, of pattern-makers, of spectacle-makers, etc., the names of which are preserved to the present day. Every trade had its separate G. of which it was necessary that a man should be a member before he was allowed to practice the particular craft. As trade increased in importance, the influence and power of the guilds increased in proportion, until at length the towns or united guilds claimed from the sovereign special rights and privileges—*quod habeant gildam mercatoriam*. The town of Southampton received a charter confirming their liberties as early as Henry II. Liverpool was made a *gilda mercatoria* by Henry III. In the reign of Henry VI., the title used was *communia perpetua* or *corporata*, which phrase has continued to be used in the modern corporations. This title of *communia* appears to have been borrowed from the continent, where, under the title of communities, the towns at a very early period obtained charters declaring their independence, and bestowing on them extensive privileges.

The exclusive privileges of English and Scottish guilds or corporations are now abolished, as being contrary to public policy; and these associations exist only for beneficiary purposes. Thus, in various boroughs in England, a custom had long prevailed, and by laws had been made, to the effect that no person, not being free of the borough or of certain of these guilds, should keep a shop for merchandise, or exercise certain trades within the borough; but since 1835, when the Municipal Corporation Reform Act passed, every lawful occupation is free, notwithstanding any such custom or by-laws. The exclusive privilege of trading in Scotch burghs was abolished 1847.—See Brentano, *On the History of Gilds* (1870); Toulmin Smith, *English Gilds* (1870); works by Schonberg, Neuburg, Schmoller (1880). Also see LIVERY: MUNICIPALITY: DEAN OF GUILD: TRADE UNION: FRIENDLY SOCIETIES.

GUILDER, *n.* *gild'ér*: a coin in Holland worth about forty cents; a florin.

GUILDFORD, *gild'ford*: municipal borough of England, cap. of the county of Surrey, in a depression in the North Downs, on the navigable river Wey, 30 m. s.w. of London, Here the Reading and Reigate Branch of the S. E. railway crosses the Direct Portsmouth line. The town, consisting mainly of one street along the steep e. side of the Wey, which is crossed here by an old bridge of four arches, is distinguished by an air of order and cleanliness. Its streets are rich in quaint old gables, overhanging panelled fronts, and long latticed windows. The chief buildings are the castle, a fine ruin, in the early Norman style; Abp. Abbot's hospital, in which reside a master, 12 brothers, and 8 sisters; the church of the Holy Trinity, with several memorable monuments; St. Mary's, an interesting specimen of the Transition style, one of the oldest and most remarkable churches in the county; the grammar school founded by Edward VI.; the town-hall; and the corn-market. A coun-

GUILDHALL—GUILLEMOT.

ty-hall and assize-court was erected 1862; and the Royal Surrey county hospital, which cost £15,000, was opened 1868. G. is now famous chiefly for its grain-market, the 'Surrey wheats' being celebrated. It has paper, powder, and corn mills; breweries, brick-fields, coach-works, and two iron-foundries. This ancient town is first mentioned by name in the will of Alfred the Great, who bequeaths it to Ethelwald his nephew. In the time of the Confessor, the town and manor were included among the demesnes of the kings of England, Henry II., John, and Henry III. frequently resided here. Pop. (1881) 10,858; (1891) 14,319.

GUILDHALL, *gild hærle*: important public building in London, which may be regarded as the town-hall. It is the place of assembly of several courts, as the Court of Common Council, the Court of Aldermen, the Chamberlain's Court, etc., and a police court presided over by one of the aldermen. The G. of London was formerly in Aldermansbury. The original building erected 1411, was almost wholly destroyed by the Great Fire 1666. In 1789 the G. was rebuilt in its present form. The hall proper is 153 ft. in length, 48 in breadth, and 55 in height. It has been famous for centuries for the magnificence of its civic feasts. It was used for this purpose first in 1500, when Sir John Shaw, goldsmith, who had been knighted on the field of Bosworth, gave here the first lord-mayor's feast.

GUILE, n. *gīl* [OF. *guille*, deceit: Dut. *ghijlen*, to de-
lude: Low Ger. *gigeln*, to deceive by juggling tricks]: craft;
cunning; artifice; duplicity: V. in *OE.*, to deceive; to dis-
guise. **GUILING**, imp. **GUILLED**, pp. *gīld*. **GUILEFUL**, a.
-fūl, crafty; insidious; wily. **GUILEFULLY**, ad. *-li*, in a
guileful manner: treacherously. **GUILEFULNESS**, n.
GUILELESS, a. artless; frank; free from guile. **GUILE-
LESSLY**, ad. *-li*. **GUILELESSNESS**, n. **GUILER**, n. *-ēr*, a
deceiver. *Note.*—GUILE is the same originally as AS. *wile*
in *wily*—Max Müller.

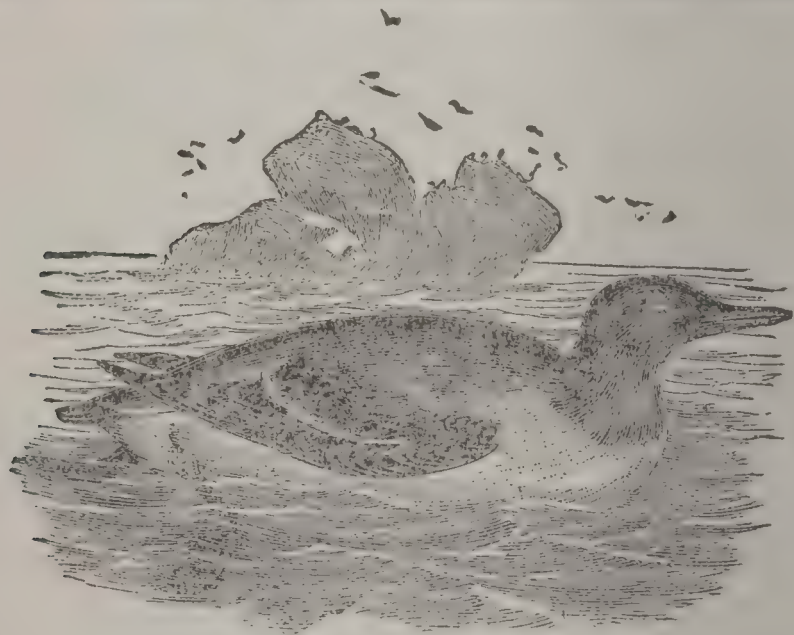
GUILFORD COURT-HOUSE, BATTLE OF: 1781, Mar.
15, in Guilford co., N. C., 5 m. from Greensborough; be-
tween a British force of 2,400 veterans under Lord Corn-
wallis, and an American force of about 4,500—of whom
3,000 were raw militia—under Gen. Greene. Two lines of
militia were forced back by the British, but when they
charged the third line, composed of veterans and deployed
near the court-house, they were repulsed with considerable
loss. Greene, unwilling to risk another attack, ordered a
retreat, and Cornwallis instead of pursuing fell back on
Wilmington. British loss 600 killed and wounded; Amer-
ican 400 killed and wounded, 850 missing.

GUILLEMOT, n. *gīl lē-mōt* [F.]: a thick clumsy sea-
fowl, found in northern Europe, Asia, and America, resem-
bling the puffin or razor bill.

GUILLEMOT, *gīl lē-mōt* (*Uria*). genus of web-footed
birds, of the group *Brachyter* (q.v.) or Divers; included
by Linnæus in the genus *Colymbus* (see DIVER), but now
generally ranked among the *Alcedæ* (see AUK) than among

GUILLEMOT.

the *Colymbidæ* (q.v). The bill is moderately long, straight, and pointed, as in *Colymbus*, but rather more compressed, and covered with feathers as far as the nostrils; the feet, as in the other *Alcadæ*, are three toed, having no hind-toe, and entirely webbed. The legs are placed very far back, and are very short, the tibia scarcely appearing beneath the abdomen, so that they are ill adapted for walking, and the posture of the bird on land is erect, even when hatching its egg. The tail is very short. The wings are short, and are moved with great frequency in flight, which, however, the guillemots are able to sustain remarkably well, in consequence of the abundant provision made for aëration of the blood by their very large air cavities. On the same account they usually float very high in the water, though when danger approaches they can sink their bodies under water till only the head, neck, and upper part of the back are visible. They excel in diving, and use their wings for progression under water, where they seek their food, which consists chiefly of small fishes and crustaceans. They are seldom seen in the seas of warm latitudes, but are extremely abundant in those of the arctic regions and the colder parts of the temperate zone, particularly near rocky coasts. The COMMON G., or FOOLISH G. (*U. troile*), is abundant on many parts of the British coasts, breeding even on those of the south of England, though large flocks also arrive in winter from the north. It abounds in all the arctic regions. Its winter migrations extend as far south as the Mediterranean, and in America to New York. It is called Foolish G., from its often suffering itself to be taken by the hand rather than leave the cliffs on which it breeds, and where prodigious numbers may be seen stationed close together on



Common Guillemot (*Uria troile*).

the ledges of rock. The parent birds are said to carry their young on their backs from the high ledges to the water. The entire length of the Common G. is about 18 inches. The Common G. lays only one egg, which has a very thick shell, is pear-shaped, and remarkably large,

GUILLOCHE—GUILLOTINE.

being more than three inches long. If the egg is destroyed or taken away, another is laid in its stead. The egg is esteemed a delicacy, but the flesh of the bird is coarse. The skin with the feathers is used for clothing in some northern regions. Young birds and eggs are among the objects in pursuit of which the rock-fowlers of the northern coasts scale or descend tremendous precipices. Great numbers of the eggs are exported from the coasts of Newfoundland and Labrador.—The **BLACK G.** (*U. Grylle*), sometimes called the Greenland Dove, is a smaller species, about 14 inches long; the plumage entirely black in summer, except a large white patch on each wing; but in winter, the under parts are white; the young are mottled or spotted. It is plentiful in the arctic regions, and is as common in America as in the old world. It lays three eggs, often on the bare rock; but if the situation is damp, it piles up for them a curious nest of pebbles. *U. californica* is found on the w. coast of N. America.—Many other species are enumerated.



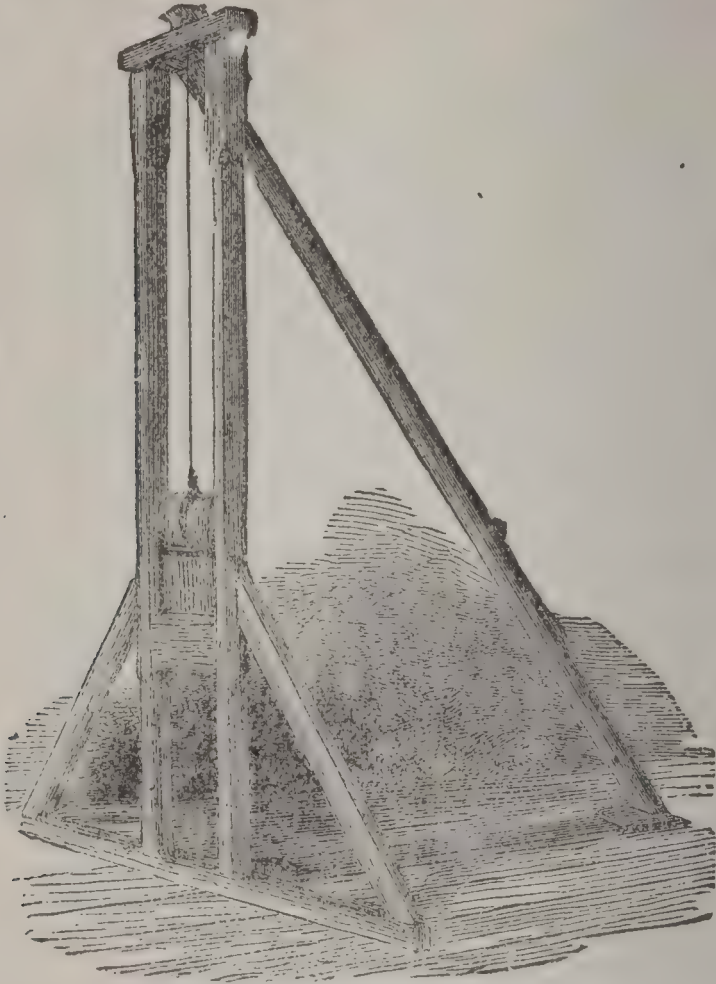
Guilloche.

GUILLOCHE, n *gîl' l'sh'* [F. *guillocher*, to make waving lines by means of an engine: *Guilloche*, the inventor], a series of interlaced ornaments on stone resembling network. **GUILLOCHED'**, a. -*l'sht'*, waved or engine-turned.—The Guilloche is of Greek origin, and consists of two or more bands or ribbons, crossing and recrossing one another in a regularly repeating pattern, sometimes very complicated.

GUILLOTINE, n. *gîl' lô-tên* [after *Joseph Ignace Guillotin* (1738–1814), a F. physician, who is said to have first suggested in the French convention its use in capital punishment as more humane]: in France and other countries, a machine for beheading at a stroke in carrying out a sentence of capital punishment: V. to take off the head by the guillotine. **GUIL'LOTINING**, imp. **GUIL'LOTINED**, pp. -*tënd*.—The Guillotine is composed of two upright posts, grooved on the inside, and connected at the top by a cross-beam. In these grooves, a sharp iron blade, placed obliquely, descends by its own weight on the neck of the victim, who is bound to a board laid below. The speed and certainty with which this machine separates the head from the trunk, gives it great superiority over the axe or sword. The invention of machines of this kind is ascribed to the Persians. In Italy, from the 13th c., it was the privilege of the nobles to be put to death by a machine of this kind, called *Mannaia*. Conradin of Swabia was put to death by such a machine at Naples 1268. An instrument resembling the guillotine was employed likewise in Germany during the middle ages. During the 16th, and till late in the 17th c., a machine called the *Maiden*, which differed but slightly from the guillotine, was used in Scotland for decapitation. That such an apparatus was known

GUILT—GUILTY.

and used in France at an earlier period, is proved by the execution in the case of the Duc de Montmorency, which is described as by a falling axe at Toulouse 1632. The



The Maiden.

Dutch in the 18th c. employed a decapitating machine in executing slaves in their colonies.

GUILT, n. *gilt* [Swiss, *gült*; Dan. *gjeld*, debt: AS. *gildan*; Dan. *gield*; Ger *gelten*, to requite, to return an equivalent]: crime; offense; state of being tainted with sin or crime. **GUILTLESS**, a. innocent; free from crime. **GUILTLESSLY**, ad. -*ly*. **GUILTLESSNESS**, n. **GUILTY**, a. *gilt'i*, not innocent; justly chargeable with crime. **GUILTILY**, ad. -*ly*. **GUIL'TINESS**, n. consciousness of crime; wickedness. *Note*.—Among the anc. warlike races 'cowardice or fear' was the greatest crime, as 'bravery (*virtus*)' was the highest virtue. This consideration may give value to the suggested Gael. etymology, *gealt*, fear, cowardice.

GUILTY: the form of verdict given by a jury in criminal cases when the crime charged has been found proved. In England and the United States, there are only two verdicts which can be given in such cases—viz, guilty or not guilty; but in Scotland there is an intermediate verdict called 'not proven,' which, though in reality a verdict of 'not guilty' (and so entered on record), yet is allowed to be given by juries when they are not satisfied that sufficient legal evidence has been given, but nevertheless consider

GUIMARÃES—GUINEA.

there was some foundation for the charge, or at least some ground for suspicion. It has been objected to this Scotch verdict that it leaves a stigma on the party; nevertheless, it is firmly adopted in the law and practice of Scotland.

GUIMARÃES, *ghī-má-rá'ēngs*: one of the most ancient, picturesque, memorable, and beautifully situated towns of Portugal, province of Entre Douro e Minho, within an amphitheatre of hills covered with luxuriant foliage, between the D'Ave and the Arezilla, 12 m. s.e. of Braga. Its narrow streets, its broad red balconies and verandas, its walls, part of which are now in the centre of the town, and are surmounted by pointed parapets, and its remains of ancient architecture give the town a striking appearance. G. was the cradle of the Portuguese monarchy, the residence of Count Henriques, and the birthplace, 1109, of Alfonso Henriques, his son, and the first king of Portugal. Among the most interesting buildings are the cathedral, founded 1385; the castle, a Flamboyant structure, surrounded by square towers; and the Dominican convent, with beautiful cloisters of the 14th c. From every elevation in or near the town, magnificent views are obtained. In the vicinity are the Caldas (hot springs) das Taipas, and the Caldas de San Miguel, both finely situated, and well appointed. These springs, well known to the ancient Romans, are used chiefly for bathing: they range in temperature from 91° to 120°, are sulphureous, and are said to be very effective in cases of gout and cutaneous disease. G. is celebrated for its currieries and its paper manufacture; it exports great quantities of dried plums and figs. Pop. 6,000.

GUIMET'S ULTRAMARINE, *gē-māz' ŭl'tra-ma-rēn'* [from its discoverer, Jean-Baptiste Guimet, chemist]: French ultramarine, a factitious pigment of a fine azure color; compound of alumina, soda, sulphur, and a trace of iron: a useful substitute for the more costly ultramarine. It is transparent and durable.

GUINEA, *n. gīn'ē* [as having been first coined of gold from *Guinea*, in Africa]: a gold coin of the value of 21s., formerly current in Britain. By reason of the origin of its gold, it originally bore the impression of an elephant. It was coined first during the reign of Charles II., 1664, and continued in common use till 1817, when it was superseded



Guinea of Charles II.

by the *Sovereign* (q.v.). Its value varied considerably at different periods, but was latterly fixed at twenty-one shillings.

GUINEA.

lings. It is still customary in Great Britain to estimate professional fees, honoraria of all kinds, complimentary subscriptions, prices of pictures, etc., in guineas; to give a physician three sovereigns and three shillings, rather than three sovereigns alone, or even three sovereigns and five shillings, is supposed to make the transaction differ from a mere mercantile one, and thus veils the sordidness which is fancied to attach to pounds, shillings, and pence. GUINEA, a. of or belonging to Guinea, as *guinea-hen*. GUINEA-PIG, a small tailless animal of the rodent or gnawing order, covered with white, red, and black patches, from S. America; probably named from a corruption of *Guiana-pig*; a cony (see CAVY). GUINEA-HEN, in *OE.* a courtesan whose favors are obtained by money.

GUINEA, *g'n'ē*: a maritime region of w. Africa. It extends from the neighborhood of the Senegal to the vicinity of Cape Negro, the stream being in lat. 16° n., and long. $16^{\circ} 33'$ w., and the headland in lat. $15^{\circ} 41'$ s, and about long. $11^{\circ} 40'$ east. By the equator, which thus intersects it, it is divided into upper or northern, and lower or southern G. This vast region forms the coasts of the Mandingoes, Ashanti, Dahomey, Benin, Biafra, Loango, Congo, Angola, and Benguela, connecting with the Atlantic distant territories by means of its rivers, especially by the Senegal, the Gambia, the Niger, the Old Calabar, the Zaire or Congo, and the Coanza. G. was visited first 1364 by some French merchant adventurers of Rouen and Dieppe, and colonized first by the Portuguese 1481, who have retained nominal possession of the whole of Lower G., the chief states of which are Loango (q.v.), Congo (q.v.), Angola (q.v.), and Benguela (q.v.). The Dutch, French, English, Danes, and even the Germans, also established various settlements, or rather factories, particularly in Upper G., the coast of which is now divided into Grain Coast, Ivory Coast, Gold Coast, and Slave Coast. Besides the articles thus designated, the soil yields indigo, pepper, cotton, sugar, and palm-oil. The factories were established chiefly to secure the slave-trade, and after its suppression their commercial importance ceased. Great Britain has ultimately endeavored to make a humane use of its acquisitions. While keeping a naval squadron off the w. African shores to intercept the slavers, it was needful to provide for the liberated cargoes of black men and women. The Sierra Leone (see FREE TOWN and SIERRA LEONE) and Gambia settlements were created for this purpose, and here the Wesleyans have many chapels and schools for the natives. For the American settlement see LIBERIA: MONROVIA. The Gold Coast, 250 m. in length, is the outer margin of a plain, bounded landward by hills covered with primeval forest. It now wholly in the hands of the English, to whom, 1872, the Dutch sold their possessions, including the important settlement of Elmina, the port of Axim, Winnebah, Accra, etc. The chief English settlement is Cape Coast Castle. The Fantees are the chief native tribe. Captain R. F. Burton and Commander Cameron, who visited the district 1881, reported that the Gold

GUINEA—GUINEA FOWL.

Coast was worth several Californias, gold being found in the sea sand. In 1903 this large region was politically divided as follows: the French colony of Senegal, the English settlements on the Gambia, the Portuguese territory of Bissao, the free negro republic of Liberia, the Ivory, Gold and Slave Coasts, the Niger delta, and the Cameruns, in Upper Guinea; and in Lower Guinea, the Spanish settlements on Corisco Bay, Gaboon, the Congo Free State, and the Portuguese territories of Ambriz, Angola, and Benguela.

GUIN'EA, GULF OF: portion of the Atlantic Ocean, extending into the great bend of the w. African coast. It stretches from about Cape Palmas, long. $7^{\circ} 44'$ w., to Cape Lopez, about lat. 1° south. At its n.e. extremity is the delta of the Niger, between the Bight of Benin on the n.w., and the Bight of Biafra on the s.e. Off its shore, reckoning from the n., are the islands of Fernando Po, Prince, and St. Thomas.

GUIN'EA CORN: a name given sometimes to Durra (q.v.); sometimes to another cereal grass, *Penicillaria spicata* or *Pennisetum typhoideum*, extensively cultivated in central Africa, and to some extent in India, where it is called *Bajree*. It is of the tribe *Pariceæ*, and may be regarded as one of the millets. It is a grass with a spike-like cylindrical panicle.

GUIN'EA FOWL, or PINTADO, pîn-tâ'dō (*Numida*): genus of gallinaceous birds of the family *Phasiunidæ*, having a short, strong bill, the upper mandible vaulted, a warty membrane at the base of the bill, and a wattle hanging down on each side, the head and upper part of the neck generally naked, the forehead surmounted either with a callous or feathery crest; the back much elevated and



Guinea Fowl (*Numida Meleagris*).

arched, the tail short. All the species are natives of Africa and Madagascar. The best known is the common G. F., or Pintado (*N. Meleagris*), with naked head, hard callous casque, and slate-colored plumage, everywhere speckled with round white spots of various sizes. It is common in Guinea, and apparently through all the regions thence to the neighborhood of the Cape of Good Hope; it is found also in more northern parts of Africa, and was known to the ancient Romans, by whom it was

GUINEA GRASS—GUINEA-WORM.

called *Meleagris* and *Gallina Numidica*. Its flesh was highly prized by them. In a wild state, the G. F. is generally in large flocks. It is not so polygamous as many of the gallinaceous birds, and even in domestication exhibits the inclination to pair. It is now not rare in the poultry-yards of parts of America and Europe, though it is more adapted to warmer than to cold climates, and in Jamaica, has been completely naturalized, so as to be destructive to crops, and to be shot like other game. In colder regions, though the young are rather troublesome to rear, the high price brought by the birds and their eggs, compensates those who keep guinea fowls for profit. The eggs are small, and have a thick strong shell, but are particularly esteemed. Guinea fowls are troublesome in a poultry-yard, from the disposition of the males to attack and tyrannize over other poultry. The G. F. has a peculiar harsh and querulous cry, which it emits with great frequency. There is a white variety.

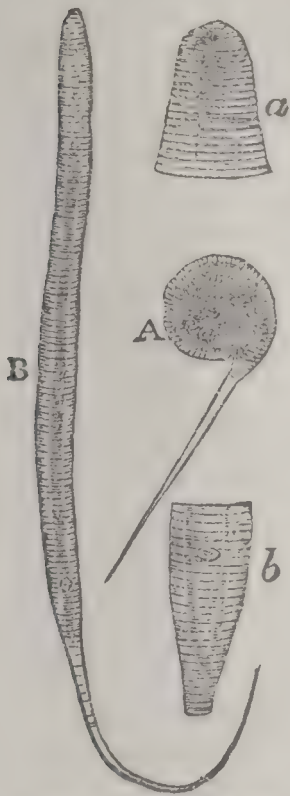
GUINEA GRASS (*Panicum maximum*): grass of the same genus with MILLET (q.v.), native of w. Africa, but now naturalized, and extensively cultivated in the W. Indies and in the southern states. It does not perish in the winters of colder countries, but is not luxuriant and productive, as in warmer climates. Its height, in favorable moist situations, is 5 to 10 ft.; in dry grounds, it is smaller; it has a much-branched and spreading panicle, long flat leaves and a somewhat creeping root. In countries favorable to its growth, it is very valuable food for cattle.—Other species of the same genus are among the most useful pasture and forage grasses of tropical countries.

GUINEA PEPPER: name variously applied to the seeds or dried fruit of several very different plants, agreeing in their peppery character, and in being the product of w. Africa. The name MALAGUETTA (Malagheta, Meleguetta, etc.) PEPPER is generally equivalent to G. P., and is at present a frequent designation of *Grains of Paradise* (q.v.); but the capsules or dry berries of *Capsicum frutescens* (see CAPSICUM) are commonly sold by druggists under the name Guinea Pepper; while both the names G. P. and Malaguetta Pepper have been applied to the dried fruit of *Cubeba Clusii* (see CUBEBS), and to the seeds of *Habzelia* (or *Xylopin*) *Æthiopica*, a shrub of the nat. ord. *Anonaceæ*. This last, formerly a considerable article of export from Guinea, and sometimes called ETHIOPIAN PEPPER, is now seldom heard of. It is an aromatic and not extremely pungent condiment.—There is great difficulty in determining which of these kinds is meant in many instances in which the term G. P. or Malaguetta Pepper is employed by the older writers; yet from the importance of the trade in this article, the name *Grain Coast* was given to a great tract of land in the Bight of Benin, and to it the establishment of the settlements of Grand Bassa and Cape Palmas is due. Till the close of the 18th c., G. P. continued in request, when the peppers of the east drove it from the market.

GUINEA-WORM (*Filaria Medinensis*, or *F. Dracuncu-*

GUINEA-WORM.

lus): parasitic animal that seems to have been known from the earliest times. Plutarch, in his *Symposiakon* (Table-



Young *Filaria Medinensis*:

A, individual coiled up, as seen in the body of its parent; B, the same uncoiled in a drop of water: a, the head; b, the commencement of the tail and the anus. (From Moquin - Tandon's *Medical Zoology*; the magnifying power not given.)

talk), quotes a passage from the geographer and philosopher Agatharchides of Cnidus, who lived in the second c. before Christ, which seems clearly to refer to this worm; and it has been argued with some plausibility that the 'fiery serpents' which attacked the Israelites in the desert were in reality Guinea or Medina worms. This view of the 'fiery serpents' was propounded by Bartholin in his *Commentary*, and Küchenmeister, an authority on parasitic animals, argues for it, on various grounds, claiming that 'in ancient times the *Filaria* [or G. W.] was reckoned among the serpents on account of its snake like form;' which he deems proved 'by the Greek name *drakontion* (Lat. *dracunculus*), a species of snake which had something fabulous and inexplicable about it.' He points out that the Israelites passed through the true district of the Medina-worm—namely, the central and e. portion of Arabia Petrea, where they are still indigenous. (*On Parasites*, I. 392-393.)

Our knowledge of the natural history of this worm is still very deficient, and concerns only the female. The body of this animal is slender, cylindrical, and somewhat compressed, and is of the thickness of pack-thread, except at the posterior extremity, where it is somewhat attenuated. It is opaque, of a milk-white color; on each side there is a longitudinal line and under the microscope, it is seen to be marked with nu-

merous transverse striae. The anterior extremity is obtuse, and the mouth circular, and beset with four acute spines (but the number, nature, arrangement, and even existence of these spines are points on which helminthologists differ). The length of the worm varies from less than six inches to three yards. On examining an adult specimen, extracted by Malgaigne in Paris in 1854, Robin found no trace of intestine, or of any organ except a very thin sheath (a uterus or oviduct), which was filled with young animals rolled up in coils, with the tail occasionally projecting outward (see A in the figure). In these young animals, can be traced the course of the intestinal canal, which apparently becomes subsequently obliterated by the excessive development of the generative organs and the eggs.

This worm is indigenous only in certain hot countries, and the laws of its geographical distribution are unknown. Küchenmeister mentions the following places notorious for

GUINEGATE—GUIPURE.

its occurrence: Senegal, Gaboon, the banks of the Ganges, Bombay, the peninsula of India, Persia, Arabia Petraea, the s. coast of the Red Sea, the region round the Caspian Sea, Upper Egypt, Abyssinia, certain districts of Nubia, and Guinea. It has been introduced into certain parts of America by negro slaves. The disorder occasioned by these worms frequently becomes an epidemic in years of heavy rain, and especially in marshy districts. It appears also to be connected with the season, being especially prevalent in the E. Indies during the rainy season, and in Upper Egypt shortly after the regular inundation of the Nile.

The mode of production of this parasite in the human body is not known. The probability is, that the young animals, while still very minute, penetrate the skin by some unknown mechanism. M'Gregor states that, in 172 cases, the invasion by the G. W. occurred 124 times in the feet, 33 times in the legs, 11 times in the thighs, twice in the hands, and twice elsewhere. After entering the body, the Guinea-worm takes a time for development varying from two months to a year or even two years. As a general rule, the vesicles caused by the inflammation excited by the presence of the worm open spontaneously in a few days, and two or three inches of the anterior end of the animal come forth. By a very gradual and gentle process through two or three months, the worm may then be pulled out. From the most ancient times, the tearing or breaking of the worm has been regarded as a very dangerous accident. It undoubtedly gives rise to violent swelling, fever, and sleeplessness.

Although the ordinary seat of the G. W. is the subcutaneous cellular tissue, it has been found in the tongue, in the layers of the mesentery behind the liver, and under the conjunctiva of the eye. Small *Filariae* of a different species have occasionally been found in the lens of the human eye.

GUINEGATE, BATTLE OF; or, more familiarly, the *Battle of the Spurs*: at Guinegate, not far from Tournai, province of Hainault, Belgium, 1513, Aug. 16; between the English, under Henry VIII., assisted by a considerable body of troops headed by Emperor Maximilian, and the French, under Duc de Longueville. The French were defeated. The battle received its familiar designation from the circumstance of the French knights having made better use of their *spurs* than their *swords*.

GUINGAMP, *gǎng-gǎng'*: town of France, dept. of Côtes-du-Nord in an extensive plain, on the Trieux, in the midst of pleasing scenery, 20 m. w.n.w of St. Briec. It was formerly capt. of the duchy of Penthièvre, and was surrounded by walls, part of which remain. The site of the castle of the dukes of Penthièvre is now planted with trees as a promenade. G. has a college, a thread-factory, and several tanneries. Pop. 8,000.

GUIPURE, n. *gǐ-pūr'* [F. thread of silk lace—from OF. *guiper*—from Goth. *veipan*, to weave]: formerly lace made with silk or thread upon vellum; a kind of ornamental

GUIPUSCOA—GUISCARD.

work for doilies, etc., consisting of a foundation netted in the usual way, which is afterward decorated with worked patterns in embroidery, silk, etc.

GUIPUSCOA, *ghī-pōs'kō-ā*, Sp. *gē-póth'kō-ā*: smallest, but most densely peopled of the Basque Provinces (q.v.).

GUISBOROUGH, or GISBOROUGH, *gīz'bār-ūh*: market-town of the North Riding of Yorkshire, England, 5 m. from the mouth of the Tees, 40 m. n. of York. It is connected with the Stockton and Darlington branch of the Northeastern railway. The town lies at the foot of the Cleveland Hills, consists chiefly of one main street of good houses, has several churches, grammar and other schools, almshouses, and market-house. The earliest alum-works in England were established here about 1600. There is a trade in wool. Rope-making, brick and tile-making, and tanning are carried on. The recent development of the ironstone mining in the neighborhood has increased the population since 1861. A rich monastery once stood here, of which a small part remains, built 1119, by Robert de Brus, lord of the town. At the time of the Reformation, this was one of the wealthiest and most magnificent monastic institutions in the kingdom. Recent excavations have brought to light many interesting antiquities. Among other objects, the workmen found the remains of an oak coffin, containing a skeleton, 6 ft. 8 inches in length. Pop. (1871) 5,859; (1881) 7,336; (1901) about 8,500.

GUISCARD, *g's-kār'*, ROBERT, Duke of Apulia and Calabria: 1015-1085, July 17; sixth in order of seniority of the 12 sons of Tancred de Hauteville. Tancred's estates in Lower Normandy being insufficient to support such a numerous family, his three eldest sons, William, Dagobert, and Humphrey, sought their fortunes in the wars of Italy. By good-fortune, courage, and wiles, William gained possession of Apulia; and Robert, desirous of sharing his brothers' success, followed them to Italy with a small band of adventurers. Here he distinguished himself so highly in various battles, that, after the death of William and Humphrey, he was proclaimed Count of Apulia. G. next conquered Calabria, in the possession of which he was confirmed by Pope Nicholas II., who, but a short time before, had excommunicated him for his many acts of violence. G., from motives of gratitude, bound himself to pay an annual tribute to the Roman see. The feudal superiority still claimed by the papal see over Naples dates from this period. G. now dispatched his youngest brother, Roger, at the head of 300 warriors, to conquer Sicily, the possession of which had been promised to him by the pope. Roger took Messina 1060, and in the following year the two brothers defeated the Saracens at Enna. Roger eventually conquered the whole island, and became first Count of Sicily. Meanwhile Robert gradually gained possession of the towns that still remained in the hands of the Saracens, among others, Salerno and Bari, and thus established what was till 1860 the kingdom of Naples. He would have carried his victorious standard in other directions, had he not

GUISE.

been excommunicated by Gregory VII., for his inroad into Beneventum. Having become involved in the affairs of Greece by the marriage of his daughter Helena with Constantine Ducas, son and heir of Michael VII., he dispatched his son Bohemond to undertake the conquest of Corfu, while he himself hastened to Durazzo, and before the walls of that city gained a brilliant victory over the Greek emperor, Alexius Comnenus. He now marched through Epirus to Thessalonica, and had nearly reached Constantinople, when he received information that Emperor Henry IV. had made an inroad into Italy. He immediately hastened back, after intrusting the chief command to Bohemond, compelled Henry to retreat, and liberated the pope, who was besieged in the castle of San Angelo. He then returned to Epirus, defeated the Greeks in several engagements, took possession of some islands in the Archipelago, and was on the point of advancing a second time to Constantinople, when he died at Cephalonias. His remains were buried at Venusa; his sons Bohemond and Roger inherited his possessions: the former received Tarentum; the latter, Apulia. G. was not only a hero and a conqueror, but a patron of the arts and sciences.—Compare Gualtier d'Arc. *Histoire des Normands en Italie, en Sicile, et en Grèce* (1830); and works by Dondorff (1875) and Steenstrup (1876).

GUISE, *n. gîz* [F. *guise*; Sp., It. *guisa*; W. *gwîs*; Bret. *giz*, way, manner]: external appearance; dress; manner; custom. GUIARDS, *n. plu. gîzerts*, or GUIERS, *n. plu. -zers*, in *prov. Eng.*; persons, chiefly young persons, who go from house to house in a sort of masquerade, about Christmas time, singing songs and soliciting contributions for holiday purposes; immediately before the New Year is the similar practice in Scotland.

GUISE, *gîz* or *gwîz*: town of the dept. of Aisne, France, on the left bank of the Oise, 37 m. n.n.e from Soissons. It is walled, and otherwise fortified. It is an ancient town, and was of much consequence in the early wars of France. Within the town are the ruins of a castle, from which the famous Dukes of Guise derived their title. G. is now a place of considerable commercial and industrial activity; has linen and cotton manufactures, tanneries, etc., weekly markets, and 8 annual fairs. Pop. (1886) 7,665; (1896) 8,082.

GUISE.

GUISE: name of a branch of the ducal family of Lorraine, distinguished in the history of France and Europe during two centuries. It derives its name from the little town of Guise, in the department of Aisne (situated on the Oise). The following are its most remarkable members:

CLAUDE OF LORRAINE, first Duke of Guise, Peer of France, Grand Huntsman, Count d'Aumale, Marquis of Mayenne and Elbeuf, Baron of Joinville, etc.: 1496, Oct. 20—1550, Apr.; b. at the Chateau of Condé; fifth son of René II., Duke of Lorraine. He left Lorraine on account of a quarrel with his elder brother, accompanied Francis I. to Italy, and received 22 wounds at the battle of Marignan, 1515. Eight years later, he drove the Germans from Champagne. In 1542 he fought in Flanders under the Duke of Orleans. He was favored by the king for his valor and talent. He married Antoinette of Bourbon, by whom he had 12 children, eight being sons. His daughter Mary was the wife of James V. of Scotland, and mother of Mary, Queen of Scots. He is reported to have died of poison.

FRANÇOIS OF LORRAINE, second Duke of G.; 1519, Feb. 17—1563, Feb. 24; son of Claude of Lorraine, first duke. As a general, he acquired European renown. He distinguished himself at Montmedy (1542), Landrecies (1543), St. Dizier (1544), Boulogne (1545), and attracted the attention of France by his defense of Metz, besieged for two months by Charles V., who, after firing 11,000 balls, and losing 30,000 men, was obliged to raise the siege (1553). He added to his reputation at Renti (1554), and in 1556 took command of the expedition against Naples. This expedition failed through treachery; but the duke, having been made lieut. gen. of France, retrieved his reputation by taking Calais, Guines, and Ham, which were in possession of the English, and were considered impregnable. His military successes were ended by the peace of 1559. His niece, Mary Stuart, being the wife of Francis II., he became the highest power in the state, and the head of the Rom. Cath. party. The death of the king, and a strong party against him, drove him from the court, but he was soon recalled, to take command against the Huguenots who had taken several important towns, and were committing great ravages. He retook Rouen, and conquered at Dreux (1562). The Maréchal St. Andre was killed, the Prince of Condé and the Constable taken prisoners. G., the greatest of his name, was assassinated before Orleans. He had a taste for literature, and his memoirs, written by himself, have much historic interest.

HENRI I. OF LORRAINE, third Duke of G: 1550, Dec. 31—1588, Dec.; son of Duke François. The death of his father placed him at the head of the Rom. Cath. party. Ambition and vengeance both stimulated him to action. At the age of 16, he distinguished himself in fighting against the Turks in Hungary. Three years later, he fought with the Huguenots at Jarnac (1569, Mar.) and Moncontour (1569, Oct.), and in the same year forced Coligny to raise the siege of Poitiers. He aspired to the hand of

GUISE.

Marguerite of Valois, but, to appease the anger of the king, married Catherine of Clèves, 1570. Disgusted with the favors granted to Protestants at the court, he retired, but returned, and was engaged in the massacre of St. Bartholomew, 1572, Aug. 24, in which he saw the dead body of Coligny thrown from a window into the courtyard at his feet. In 1575, fighting with the Huguenots, he was wounded in the face, whence he received the name of *Balafré* (scarred), a designation borne also by his father from a similar circumstance. He formed the famous League—ostensibly for the defense of the church, really to raise himself to the throne of Charlemagne. The king coquetted with both parties. G. conquered Henri of Navarre, but the king refused him entrance to Paris. The people rose in his favor, and he might have been king, but he negotiated. He was promised all the powers which he demanded, but the king caused him to be massacred in the palace, and is said to have kicked his lifeless body. His brother the cardinal also was killed. Their bodies were burned, and their ashes scattered to the winds.

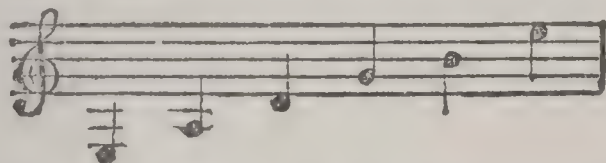
HENRI II. OF LORRAINE, fifth Duke of G.: 1614-64; grandson of Duke Henry I. He was intended for the priesthood, and at the age of 12 possessed nine abbeys; at 15, he was Abp. of Reims, but on the death of his elder brother he quitted a calling which he detested, and succeeded to the dukedom. Handsome, chivalric, brave, he was a true specimen of the ancient paladin, and noted for his numerous gallantries. Loved by Anne de Gonzague, Princess of Mantua, he capriciously abandoned her, joined the party of the Comte de Soissons, and married the widow of the Comte de Bossut. Having joined the league against Richelieu, he was condemned by the parliament of Paris to capital punishment, but took refuge in Germany. On the death of Louis XIII., he returned to France, disgusted with his wife, whose fortune he had spent, and proposed to marry Mademoiselle de Pons, one of the queen's maids of honor. He fought in the campaigns of 1644, 5, as a volunteer, and then repaired to Rome to get a divorce, but failed. Hearing of the revolt of Naples against Spain, under Massaniello, he set off for that city, in a spirit of knight-errantry, to conquer a kingdom with his sword for the bride that he still hoped to gain. Passing in a felucca through the Spanish fleet, G. entered Naples 1647, Dec., and was received with the utmost enthusiasm; but his gallantries, the envy of the nobles, and jealousy of France, caused him to be betrayed, 1648, Apr., to the Spaniards, and he was carried prisoner to Spain. Demanded by Condé, he was set at liberty 1652, and joined, with Condé, the enemies of the court and of Mazarin at Bordeaux. Two months later, he had betrayed his allies, and was at Paris with the king, but misfortune still followed him, and he found that his mistress, for whom he had endured so much, was false, and that with his own esquire. Finding himself an object of ridicule at Paris, he attempted to return to Naples, but failed; returned to Paris, was made grand chamberlain, there directed the magnificent fêtes of

GUITAR—GUITEAU.

Louis XIV., and died, leaving no children. His *Mémoires* (2 vols., Paris 1669) were really written by his secretary, St. Yon.

Henry II. was succeeded by his nephew Louis Joseph, Duke of G., Joyeuse, and Angoulême. With the son of the latter, François Joseph, who died 1675, the direct line of the Dukes of G. of the house of Lorraine became extinct. The family possessions passed to the Condé, as being the nearest of kin among French houses. Charles, Duke of Mayenne, one of the most zealous leaders of the League was a member of the house of Guise. He died 1611. Of the descendants of Henry I., the most notable were Charles, who inherited his father's dignities, and died in Italy, whither he had been banished by Richelieu 1640; and Claude, Duke of Chevreuse, whose wife was Maria von Rohan-Montbaz, widow of the Constable de Luynes (d. 1679). Louis de Lorraine, Cardinal de Guise (b. 1580, d. 1621), was a nephew of the fifth Duke of G. Entering the priesthood against his inclination, he became abp. of Rheims 1615. He had five illegitimate children by a mistress of King Henry IV. See Bouillé *Histoire des Ducs de G.* (4 vols. Paris 1850).

GUITAR, n. *gŭ-târ* [F. *guitare*—from Sp. *guitarra*, a guitar: L. *cithārā*, a harp]: musical stringed instrument, much in the form of a violin, but with a longer neck, and played upon with the fingers. It is well adapted for accompanying the human voice, and much esteemed in Spain and Italy. It has six strings, tuned as follows:



and the sound is produced by the fingers of the right hand twitching the strings, while the fingers of the left hand make the notes of the music on the finger-board, which has frets across it like the lyre. The three highest strings of the guitar are always of gut and the three lowest are of silk spun over with silvered wire. The greatest virtuosi on the guitar were Giuliani, Sor, Zocchi, Stoll, and Boretzskv.

GUITEAU, CHARLES JULIUS: an American assassin; b. about 1840; was a lawyer in Chicago. After the election of James A. Garfield to the presidency of the U. S. in 1880, G. went to Washington to seek the office of U. S. consul at Marseilles. He was unsuccessful in his purpose and owing to his failure and the fact that the new president was opposed to the "Stalwarts," led by Roscoe Conkling, became greatly incensed. Guiteau shot the president in the waiting room of the Baltimore and Potomac railroad at Washington, 1881, July 2, and the president died from the effects Sept. 19 following. Guiteau was arrested, indicted for murder, and was hanged, 1882, June 30.

GUIZOT.

GUIZOT, *gê-zô'* or *gwê-zô'*: FRANÇOIS PIERRE GUILLAUME: 1787, Oct. 4—1874, Sep. 12; b. Nîmes: French statesman and historian. His parents were Protestants; his father, an advocate, perished on the scaffold, 1794, Apr. 8, and his mother soon afterward went with her two sons to Geneva, where G. received his education. In 1805, he went to Paris, and engaged in literature. His first work, the *Nouveau Dictionnaire Universel des Synonymes de la Langue Française* (2 vols.; 4th ed. Paris 1848), appeared 1809; the introduction reveals a very methodical mind. The next seven years was spent in laborious literary activity. After the second Restoration, he became general sec. to the ministry of the interior, afterward to the ministry of justice. On the retirement of Barbé-Marbois, G. tendered his resignation, and was first appointed *maître des requêtes*, afterward councilor of state. G. contributed to the dissolution of the *Chambre Introuvable*, by writing a memorial which was placed in the hands of Louis XVIII, by Decazes. The latter committed to him the general direction of the administration of the *communes* and *departements* (1819). His writings 1820–22 are entitled *Du Gouvernement de la France depuis la Restauration et du Ministère Actuel* (1821), *Histoire des Origines du Gouvernement Représentatif*, containing his lectures at the Sorbonne (where he held the position of lecturer on history) 1820–22 (new ed. 1852). Government forbade his lectures 1824, and G. again betook himself to literature. In conjunction with several other men of letters, he published the important *Collection des Mémoires Relatifs à l'Histoire de France, depuis la Fondation de la Monarchie jusqu'au 13^{me} Siècle* (31 vols. Paris 1823–35); and the *Collection des Mémoires Relatifs à l'Histoire de la Révolution d'Angleterre* (26 vols. Paris 1823). He likewise edited several works of other authors, with introductions, annotations, and additions, such as Letourneur's translation of Shakespeare (12 vols., Paris 1821), Hallam's *History of England* and Mably's *Observations sur l'Histoire de France*, followed by the *Essais sur l'Histoire de France*. In addition he published *Histoire de la Révolution d'Angleterre* (2 vols. Paris 1826; 4th ed. 1845), and edited the *Encyclopédie Progressive*, and the *Revue Française*. In the following year, the Martignac ministry granted him permission to resume his course of lectures on history. These were attended by a large and enthusiastic audience, and gave rise to several historical works of great value, published under the collective title of *Cours d'Histoire Moderne* (1828–30); among others, the *Histoire de la Civilisation en France depuis la Chute de l'Empire Romain jusqu'à la Révolution Française* (5 vols. Paris 1828–30; 5th ed. 1845), and the *Histoire Générale de la Civilisation en Europe*, etc., which serves as an introduction to the former work. 1829, March 1, he again took his place in the council of state, and 1830, Jan., was elected by the town of Lisieux, which he continued to represent in the chamber.

After the July revolution, G. became successively minister of public instruction and minister of the interior, an

office which he held, with two interruptions, till 1836. In this capacity he did much for improvement of educational institutions, particularly primary schools. On the breaking out of the Eastern disturbances in the beginning of 1840, under Soult's administration, G. was sent as ambassador to London. After Soult's retirement 1847, Sep., he became the official leader of the cabinet, which maintained its ground, as the organ of Louis Philippe's policy, till the revolution of 1848, Feb., and by its conduct both in home and in foreign affairs, did much to bring constitutional government into disrepute, and to hasten the overthrow of the Orleans monarchy. As a statesman, G. in carrying out his systematic and repressive line of policy, proved himself stiff, one-sided, and latterly obdurate; from these qualities, as well as from his cold and disagreeable manner, he was always very unpopular with the nation. As a man of rectitude and austere morals, he never enriched himself at the public cost; but nevertheless, from political motives, he allowed others to do so during his administration, in the most flagrant manner. After having effected his escape from Paris, he retired to London, where he was received with great respect. In 1849, Apr., he published a circular *Guizot à ses Amis*, in which he offered his services to the electors of France, but ineffectually. In Nov. following, he returned to Paris, where he continued to labor in conjunction with the heads of the monarchical parties. After a short visit to Louis Philippe in England, 1850, June, he came forward in Paris as the main promoter of the fusion, and wrote likewise in the *Assemblée Nationale*. The *coup d'état* of 1851, Dec. 2, put an end to this career; and G. returned to England. By founding the *Comités Historiques*, by bringing about the publication of important historical documents, and by his own writings and lectures, he did much to extend a taste for historical studies in France. In 1837, he was intrusted by the government of the United States with the task of writing a history of Washington. His work, *Vie, Correspondance, et Écrits de Washington* (2 vols., Paris 1839-46), procured him the honor of having his portrait placed in the Chamber of Representatives at Washington. After the February revolution, G. published several political treatises, more or less important; among them were *Révolution d'Angleterre*, and *Monk, Chute de la République*. He likewise wrote *Méditations et Études Morales sur la Religion, la Philosophie*, etc. (1852); *Corneille et son Temps*, (1852); *Shakspeare et son Temps* (1852). In 1858, appeared his *Mémoires pour servir à l'Histoire de mon Temps*. His publication, 1861, defending the temporal power of the pope, was a strange one for a Protestant. Among the most important of his latter works are *Méditations sur l'État Actuel de la Religion Chrétienne* (1865); *Mélanges Biographiques et Littéraires* (1868); *Mélanges Politiques et Historiques* (1869), etc. After his death was published *L'Histoire de France, racontée à mes Petits-Enfants*. G. was thrice married; his first two wives were accomplished women, and not unknown in literature; his son MAURICE GUILLAUME G., prof. of literature, is also an author. G.'s daughter, Madame de Witt,

GUIZOTIA—GULF.

published a life of her father (transl. *G. in Private Life*, 1881).

GUIZO'TIA: see RAM-TIL.

GUJARAT': see GUZERAT.

GUJRAT, or GOOJRAT, *g ĵ-rát'*: walled town of the Punjab, chief town and headquarters of the dist. of G.; on the right side of the Chenab; a place of some military and political importance, being on the great route between Attock and Lahore. Here, 1849, a Sikh army of 60,000 men was utterly defeated by a much less numerous British force. Pop. about 16,000.

GULA, n. *gũ lă*, or GOŁA, n. *gō'łă* [L. *gula*; It. *gola*, the throat]: the alternate convex and concave parts of the molding of a cornice; the cyma.

GULCH, v. *gũlch* [Dan. *gulpe*, to disgorge, to vomit; an imitation of the sound made in swallowing a liquid (see GULP)]: in *OE.*, to swallow voraciously: N. a glutton. GULCH'ING, imp. GULCHED, pp. *gulcht*.

GULCH, n. *gũlch* [see GULCH 1, and GULP]: in *OE.*, a gully or swallow in a river; in *s. Africa*, a short ravine; a short deep lit of a torrent's bed when dry; a miniature cañon.

GUL'DEN: see FLORIN.

GULES, n. plu. *gũlz* [Fr. *gueules*, the mouth and throat, hence red. Other origins are given, such as the Persian *ghul*, a r o e or rose color, which seems more probable than the Hebrew *gulude*, a piece of red cloth, from which Mackenzie derives it; it being scarcely likely that it came from a Semitic source]: in heraldry a term denoting red; in engraving, it is marked by perpendicular lines traced from the top of the shield to the bottom: see HERALDRY. It is supposed to indicate valor, magnanimity, and the like, and is regarded as the most honorable heraldic color.

GULF, n. *gũlf* [F. *golfe*, a whirlpool, a gulf—from It. *golfo*, an arm of the sea: Dut. *gulpen*, to swallow]: a tract of ocean water extending into the land; an arm of the sea; an abyss; a deep place in the earth; anything insatiable. GULFY, a. *gũlf'ĭ*, full of or resembling gulfs.

GULF STREAM—OCEAN-CURRENTS.

GULF STREAM—OCEAN-CURRENTS: vast and continuous drifts or streams of portions of oceanic waters—the Gulf stream being most important and best known. It derives his name from the Gulf of Mexico, out of which it flows, between the coast of Florida on one side, and Cuba and the Bahama Islands and shoals on the other. With a breadth of about 50 m. in its narrowest portion, it has a velocity at times of five m. an hour, pouring along like an immense torrent. This great ocean-river flows n. e. along the American coast, gradually widening its current and diminishing in velocity, until it reaches the island and Banks of Newfoundland, when it sweeps across the Atlantic, and divides into two portions, one of which turns e. toward the Azores and coast of Morocco, while the other laves the shores of the British Islands and Norway, and can be perceived on the s. borders of Iceland and Spitzbergen, nearly as far e. as Nova Zembla.

The waters of the Gulf Stream are of deep indigo blue, with boundaries sharply defined against the light green of the seas through which it passes in its early course. It abounds with masses of sea-weed torn from the coral rocks of the strait through which it passes when it has its greatest power and velocity; while in its warm current may be seen myriads of fish and of animalculæ. As this great stream pours out of the Gulf of Mexico, it has a warmth of 84° in summer, being 4° higher than that of the ocean at the equator. In mid-Atlantic, opposite Nova Scotia, it has fallen at all seasons only about 14° ; while the British Islands and n. w. coasts of Europe, at a distance of 4,000 m. from the Gulf, are bathed with waters heated under a tropical sun, and have their temperatures raised in winter about 30° above the normal temperature of the latitudes. In mid-winter, off the inclement coasts of N. America, between Cape Hatteras and Newfoundland, ships beaten back from their harbors by fierce north-westerners, until loaded down with ice and in danger of foundering, turn their prows to the east, and seek relief and comfort in the Gulf Stream. A bank of fog rising like a wall, caused by the condensation of warm vapors meeting a colder atmosphere, marks the edge of the stream. The water suddenly changes from green to blue, the climate from winter to summer; and this change is so sudden that when a ship is crossing the line, it is declared that a difference of 30° of temperature has been marked between the bow and the stern.

The great differences of temperature between the w. shores of Europe and the e. shores of America have been attributed, too largely, perhaps, to the influence of the Gulf Stream. There is no doubt that such an immense body of heated water in the n. e. Atlantic must raise the temperature of the atmosphere, and that to this importation of the effects of tropical sunshine by sea is due, to a certain extent, Ireland's perpetual green, the soft moist climate of England and Scotland, and the fact that the harbors of the western and northern coasts of Norway, as far east as Varanger Fjord, remain open, when the Baltic, much further south, is a sheet of ice. England, clothed in perennial verdure,

GULF STREAM—OCEAN-CURRENTS.

and Scotland, where the grass grows during eleven months of the year, are in the same latitude as the frozen and repulsive coast of Labrador. Norway is opposite Greenland; and Lisbon, where frost is scarcely known, is in the same latitude as Washington, where the Potomac river, a mile in breadth, sometimes freezes over in a single night. This difference is to be ascribed not to the Gulf Stream alone, but to that in conjunction with the prevailing s.w. winds. The Mediterranean, exposed to no cold currents from the arctic regions bearing bergs and fields of ice, is a constant receiver and distributor of heat, and modifies the temperature of adjacent regions. North America, on the contrary, is exposed along its eastern shore to a great current from the Polar Seas, running inside and counter to the Gulf Stream, and coming loaded with ice from the northern regions; and while the continent narrows toward the tropics, it grows broad in the polar regions, from which come the cold north-westerns, the prevailing winds during the wintry season.

The effect of the Gulf Stream on temperature has been nowhere more strikingly observed than in high northern latitudes. Where the warm stream from the s.w. meets the Arctic current in lat. of Iceland, a difference of 17° has been observed.

In treating of the cause or causes of the Gulf Stream, we must take a general view of ocean-currents. Taken altogether, they form a connected system antly compared to the circulation of the blood. The two prime movers are differences of temperature and prevalent winds. Sea-water of average saltness does not freeze until it is cooled down to about 28° ; and, unlike fresh water, it continues to grow heavier down to that point. The effect of the intense cold of the polar regions is thus to cause a constant sinking down of the surface-water, and to establish a current of ice cold water along the bottom toward the equator; while to supply the place of what sinks down, an in-draught or northward flow takes place on the surface, which brings the warm water of the temperate and tropical regions toward the poles. This is the general theory of the *vertical* circulation of the ocean—a circulation which might almost be assumed from the well-known laws of the flow of liquids, and which recent observations have established as a fact. The general prevalence of cold currents along the bed of the ocean from the poles to the equator is now beyond dispute. The soundings taken recently by H.M.S. *Challenger* show the temperature of the bottom water between Sombrero in the W. Indies and Tenerife to vary from $34^{\circ}4$ to $35^{\circ}5$; while at the equator it is in some places still lower, being only $32^{\circ}4$. This is held to prove that the Antarctic bottom current extends to the equator and beyond it. Motion once thus begun, however, is differently modified in each locality by the shape of the coasts, by prevalent winds, and other circumstances. But one cause which modifies all currents that tend either north or south, is the daily rotation of the earth. In the very same way that the rotation of the earth gives the trade-winds their peculiar

GULF STREAM—OCEAN-CURRENTS.

directions (see WINDS), it causes the cold currents coming from the poles to turn toward the southwest, and the surface-currents from the south to take a n.e. direction. At the equator, any spot on the surface is moving eastward at the rate of 1,000 m. an hour; at 60° north latitude, the velocity is only one half. Thus, the water of a current starting from the equator northward, is constantly coming to places where the bottom under it has less and less eastward velocity. But, by the law of inertia, the water tends to retain the same velocity eastward with which it started, and thus it moves to the e. of north—shooting ahead, as it were, of the bottom over which it is flowing, as a rider does whose horse slackens his pace. The contrary happens to a stream flowing from north to south. In this case, the eastward motion or motal inertia of the water is too slow for the parts of the bottom to which it successively comes; the bottom slips in a manner from under it, and it falls to w. of south. This, in combination with the action of opposing coasts, accounts for the circular sweep which many of the currents make, returning partly into themselves.

Different in origin from this vertical circulation, though partly connected with it, is the *horizontal* circulation caused by prevalent winds. The best example of this is the Equatorial Current, which sets from the w. coast of Africa to the e. coast of Brazil, and which is owing to the action of the trade-winds. Currents caused by winds are called 'drift-currents,' in opposition to the deeper seated 'stream-currents.' In order to feed this westerly equatorial current, there spring up two *in-draught* currents, which also follow the prevailing winds of their respective regions—one from the n. along the w. coast of Portugal and Morocco, the other from the Cape of Good Hope along the w. coast of Africa, as far as the Gulf of Guinea. When the equatorial current reaches the coast of Brazil, it divides into two branches. One proceeds southward turning gradually eastward across the Atlantic until it falls in with the northern in-draught from the Cape of Good Hope. The other branch is deflected northward into the Caribbean Sea and the Gulf of Mexico. The water thus driven into this pent-up sea then rushes out with accumulated momentum through the strait or gulf between Florida and the Bahamas, and forms the famous Gulf Stream.

It has usually been held that the Gulf Stream extends across the Atlantic to the shores of n. Europe, and is the cause of the mild and moist climate enjoyed by the western parts of that continent. The opinion, however, is beginning to prevail that, as a distinct current, the Gulf Stream ceases in the middle of the n. Atlantic, its waters being by this time thinned out to a mere film, and its initial velocity and distinctive heat having been dissipated. That warm waters from tropical seas are brought to the coasts of Britain, and even into the polar seas beyond, is proved by drift-wood, seeds, and fruits from the W. Indies being frequently cast ashore on the Hebrides, the n. of Norway, and Spitzbergen. But this is accounted for by the general flow

GULF STREAM—OCEAN-CURRENTS.

of the surface-water toward the poles, forming part of the vertical oceanic circulation; a flow which receives an eastward deflection as it proceeds northward, in the way above explained. This general set of the surface-water is further promoted by the prevalence of s.w. winds, which maintain a nearly constant n.e. *drift* over the whole surface of the n.e. portion of the Atlantic. In this way, though the Gulf Stream may have lost its original impetus, a large portion of the super-heated water which it brings into the centre of the Atlantic is carried to the shores of Europe and into the Arctic Sea.

The Pacific Ocean also has its great equatorial or trade-wind current, but there is no great basin like the Gulf of Mexico to gather the waters of another Gulf Stream. A portion of the equatorial current passes northward along the shores of China and Japan; a portion passes through the narrow channels of the Indian seas, and another portion turns southward toward Australia and New Zealand, affecting, doubtless, the isothermal lines in those latitudes, and returning in counter currents to Cape Horn, and even passing around it into the Atlantic. While thus a portion of the great counter or Polar current of the South Pacific sweeps around Cape Horn, another portion passes up the w. coast of S. America across the equator to 5° n. lat.; and its coolness is sensibly felt, and was carefully observed by Baron Humboldt on the coast of Peru. The currents in the waters between the Pacific and Indian oceans also are variously affected by the monsoons, and in some places run six months in one direction, and six months in the opposite, clearly proving that they are dependent mainly on the direction and force of the winds. A chart of ocean currents was published by the British Admiralty 1872, which proves beyond a doubt that an explanation of ocean currents must be sought almost wholly in the prevailing winds.

At first sight, it appears incredible that a current of water should force its way through the ocean with sharply defined boundaries, and a peculiar color, temperature, and inhabitants, like a great river flowing between its banks, for thousands of miles, and against the force of counter-currents, which even cross its course, passing under by their superior density, until it loses its momentum on the shores of distant continents, or spreads out its warm flood on the bosom of northern seas. But a closer observation will satisfy us that all this is in accordance with the laws of hydrodynamics. At the confluence of the clear waters of the Mississippi with the turbid current of the Missouri, the two rivers do not at once unite, but run side by side with a sharply defined boundary between them for many a league. So great rivers running into the ocean, are rivers still, far out at sea. The current of the Rio de la Plata, which drains the southern portion of S. America, can be perceived 200 m. from land; and the Amazon sweeps far into the Atlantic, though gradually bent northwardly by the great trade-wind current, and then carried along the coast to help, with the Orinoco, to swell the waters of the Gulf of Mexico; so that the

GULFWEEED.

waters of the Amazon, the Orinoco, the Rio Grande, and the Mississippi, all join to swell the Gulf Stream.

The channel of the Gulf Stream in its narrower portion is of great depth. From observations made by the *Challenger* 1873, in that part of the stream between Bermuda and New York, it is seen the Gulf Stream is there about 100 fathoms deep, and 80 m. wide. The probability of its having hollowed out for itself a well-defined channel like the bed of a river, is shown by a sudden increase of depth at its border, where deep-sea soundings have been made; though so little can be known of the effect of currents upon a line of 20,000 ft. in length, and which requires several hours to run off the reel, that implicit reliance cannot be placed on such observations.

More important observations on the courses and influence of these currents have been lately undertaken by dropping bottles containing the date, latitude, and longitude, in all parts of the ocean. These bottles, when found upon a coast thousands of miles distant, give some indication of the direction and velocity of the currents that have brought them; but such testimony is not infallible. The bottle may be impeded by contrary winds, blown into counter currents, or whirled about for months in eddies. A bottle thrown overboard in the Indian Ocean might reach the island of Spitzbergen, *viâ* the Gulf of Mexico; but there are many chances that it would be thrown out of the regular current, and be picked up on the shores of New Zealand or the coast of Peru. See Dr. Franklin's *Maritime Observations*, Pownall's *Hydraulic and Nautical Observations*, Humboldt's *Atlas Geographique et Physique*, Johnston's *Physical Atlas*, Maury's *Physical Geography of the Seas*, and *Wind and Current Charts*, and Admiralty wind and current charts for Pacific, Atlantic, and Indian oceans.

GULF WEED (*Sargassum*): genus of sea-weeds (*Algæ*) of the sub-order *Fucaceæ*, of which two species (*S. vulgare* and *S. bacciferum*) are found floating in immense quantities in some parts of the Atlantic, Pacific, and Indian oceans. They are tropical plants, though sometimes carried by winds and currents to the northern coasts. The frond is very long, and is furnished with distinct, stalked, nerved leaves, and simple axillary stalked air-vessels. The receptacles are linear, in small axillary clusters or racemes. The trivial name *bacciferum* applied to one of the species, is derived from the berry-like appearance of the air-vessels. The G. has been found only floating, but there is reason to think it is at first attached to the bottom of comparatively shallow parts of the sea. It floats in large fields, or more frequently in long yellow lines in the direction of the wind. In crossing the Atlantic, its presence is regarded as a sure indication of the Gulf Stream, by which it is wafted northward and eastward. Where the Gulf Stream is deflected from the banks of Newfoundland eastward, and sends off its more southern branch toward the Azores, is situated the *Sargasso Sea* 'that great bank of weeds, which so vividly occupied the imagination of Christopher Columbus, and which Oviedo calls the sea-weed meadows' (*Humboldt*),

GULIELMA—GULL.

The quantity of floating sea-weed is often such as to impede the progress of ships. Multitudes of small marine animals accompany it, with fishes ready to prey on them.—The G. is eaten in China; and in other parts of the East also, it is used in salads and as a pickle.

GULIELMA, *gū-lī-ě'lma*: genus of S. American palms, with pinnate leaves (entire in young plants), natives of the lower mountain-ranges of Peru and New Granada. One species, *G. speciosa*, is much planted by the Indians of the



Gulielma Speciosa.

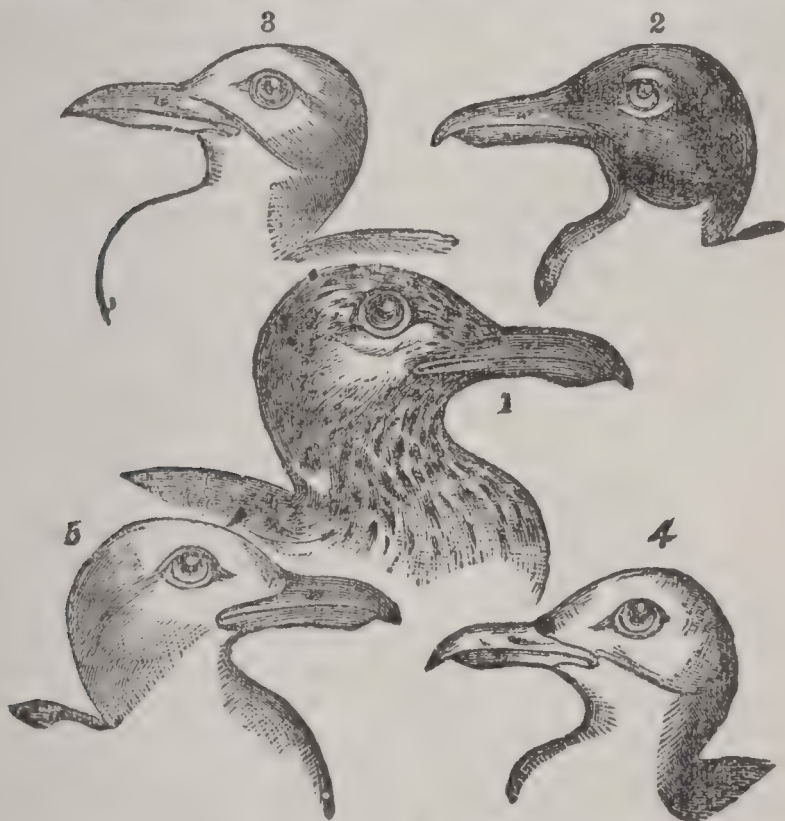
Amazon district and of Guiana and Venezuela, near their villages, and supplies them with food and other necessities. It is often 60 ft. high, having an erect slender stem, encircled with many rings of needle-like spines, and numerous drooping leaves forming a nearly spherical crown. It is variously called *Papunha*, *Paripou*, etc., and sometimes *Peach Palm*.

GULL, v. *gŭl* [Dan. *gual*; Sw. *gul*, yellow—from the yellow color of the down or beak of a young bird: comp. Gael. *gall*, a Lowlander, a Saxon, a foreigner]: to cheat; to deceive; to defraud: N. a cheat; a trick: one easily cheated. GUL'LING, imp. GULLED, pp. *gŭld*. GUL'LIBLE, a. -*lī-bl*, easily deceived. GUL'LIBILITY, n. -*bīl ī tī*, the state or condition of being easily cheated or defrauded.

GULL, n. *gŭl* [W. *gwylan*; Bret. *gwelan*, from the peculiar

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lar wailing cry of the bird: Bret. *gwela*, to weep: It. *gulone*], (*Larus*): genus of web-footed birds, of the family *Laridae* (q. v.), inhabitants of the sea coasts of all parts of the world. The formation of the head and bill of several species is shown in the accompanying illustration. The feet have three toes in front completely united by a web, and a small hind-toe not included in the web, and sometimes altogether wanting. The wings are long and pointed. Gulls have great power of wing, and fly apparently with ease against a storm, during the continuance of which they generally fly low, whether over sea or land, but in fine weather soar higher in the air, in which they seem to delight in performing the most varied and beautiful evolutions. They descend with great rapidity to seize prey from the surface of the water or at a small depth; but they are not good divers, and the fishes which they catch are chiefly those which, like the herring and others of the same family, swim near the surface. They are very voracious. Their food consists of almost anything animal. Many are wholly or partially migratory, breeding in colder regions than those which they inhabit in winter. In general, they lay only two or three eggs, which are large for the size of the bird.



Heads of Various Species of Gulls:

1, Great Black-backed (young); 2, Black-headed; 3, Kittiwake; 4, Lesser Black-backed; 5, Herring Gull.

Many of the gulls are frequent visitors of inland districts, ascending rivers, and hovering over them in quest of prey as over the sea. Some also are often seen in meadows and plowed fields, seeking for worms and other such food. It is a common notion in Britain that the appearance of gulls in inland districts betokens stormy weather. But in America, the migrations of some of the species between

GULLET.

the northern seas and the Gulf of Mexico are performed, not only along the Atlantic coast, but by the great lakes and the valleys of the Ohio and the Mississippi, and a few occasionally remain and breed near these inland waters. Large flocks of a species of gull (*L. serranus*) frequent the lakes of the high table-lands of Peru.

Some at least of the larger gulls break the shells of mollusks by taking them up to a sufficient height in the air, and dropping them on a rock. This interesting fact is attested by Audubon, the American ornithologist, as having come under his own observation, and he mentions an instance in which a gull, finding the shell not broken by the fall, carried it up a second and a third time, and each time higher than the former.

The flesh of gulls is rather coarse, but that of the young is in request on many northern coasts as an article of food, and is salted for winter use. The eggs of certain species, such as the Black-headed Gull, are said to be very palatable, and are collected in great quantities in some places where these birds breed in large numbers.

The plumage of gulls is generally in great part white, variously mixed with gray, slate-color, brown, and black. The white, in some species, assumes a rosy tint in the breeding season; and the head of some becomes black. The differences of plumage, according to age and season and sex, are considerable, and have led to many errors as to species.

Among common American species is the HERRING GULL (*L. argentatus*), a large bird, frequent on rocky coasts; the KITTIWAKE (*L. tridactylus* or *L. rissa*), about 15 inches in length, gray and white, destitute of hind-toe; it is plentiful where the coast is girt with rocky precipices, on the narrow ledges of which it makes its nest; in Britain its young and eggs are among chief objects of pursuit of the rock fowlers; and the GREAT BLACK-BACKED GULL or WAGEL (*L. marinus*), nearly 30 inches long. In Britain the GLAUCOUS GULL or BURGOMASTER (*L. glaucus*), is common as a winter visitant from arctic regions; scarcely inferior in size to the Great Black-Backed, and by some supposed to be identical with it; it is of pale bluish-gray color above, and white below. This species seems to have acquired its name of Burgomaster from the superiority which, in virtue of its size and strength, it asserts over most of the smaller birds of the northern seas, compelling them to relinquish prey at its approach. The COMMON AMERICAN GULL (*L. zonorhynchus*) is not found on the eastern shores of the Atlantic.

GULLET, n. *gŭl' lēt* [F. *goulet*, the gullet—from *goule*, the mouth: Bav. *gŭllen*; Swiss, *gŭlle*, a sink: L. *gula*, the throat or gullet]: the passage in the neck and chest of an animal down which food and drink pass into the stomach; the œsophagus: see CÆSOPHAGUS. GULLY, n. *gŭl' lī* [F. *goulotte*]: a channel or hollow formed by running water; a ditch; a gutter. GUL' LIED, a. *-lid*, having a hollow worn by water. GULLY-HOLE, the mouth of a drain where the

GULLIVER—GULUNCHA.

water pours with a gurgling noise into the sink or the main sewer.

GULLIVER, *gŭl'li-ver*, JOHN PUTNAM, LL.D : Congl. minister: b. Boston, 1819, May 12. He graduated at Yale College 1840 and Andover Theol. Seminary 1845, was pastor of Congl. churches at Norwich, Conn., 1846-65, and Chicago 1865-68, pres. of Knox College (Congl.) Galesburg, Ill., 1868-72, pastor of the 1st Pres. Church, Binghamton, N. Y., 1872-78, and chosen prof. of the relations of Christianity and secular science in Andover Theol. Seminary 1878. He d. 1894, Jan. 25.

GULLY: see under GULLET.

GULLY, n., or GULLEY, n. or GULLIE, n. *gŭl'li* [W. *gyllell*, a knife, *gylyf*, a sickle: comp. L. *gula*, the windpipe]: in *Scot.* and *prov. Eng.*, a large clasp-knife. *Note.*—Perhaps GULLY may be so named from its suitability as a weapon of defense or attack, as in throat-cutting.

GULP, v. *gŭlp* [Dut. *golpen*, to drink greedily: Dan. *gulpe*; Norw. *gulka*, to gulp up]: to swallow eagerly or in large draughts: N. as much as can be swallowed at once. GULP'ING, imp. GULPED, pp. *gŭlpt*.

GULUNCHA, *gŭ-lŭn'cha* (*Cocculus cordifolius*): plant of the same genus which yields Calumba (q.v.), extensively used in the E. Indies as a tonic and febrifuge. It is largely cultivated in some parts. It is a climber, with heart-shaped leaves. It has wonderful tenacity of life. When it has acquired the diameter of half an inch, it is not unusual to cut from the main stem a portion 20 to 30 ft. in length, when the part sustained by the branches of the tree sends down threads to the ground, which take root, and become new stems. To plant it, a few yards of the stem are merely made into a coil, and hung on the branch of a tree (Ten-*nant's Ceylon*).

GUM.

GUM, n. *gŭm* [F. *gomme*; L. *gummi*; Gr. *kommi*, gum; Lang. *goumo*, sap]: a vegetable mucilage or glue, found thickened on the surface of certain trees: V. to smear with gum; to unite with gum. **GUMMING**, imp. **GUMMED**, pp. *gŭmd*: **ADJ.** covered or smeared with gum. **GUMMIC**, a. *gŭm'mik*, of or pertaining to gum. **GUMMIFEROUS** [L. *fero*, I carry]: bearing or producing gum. **GUMMOUS**, a. *-mŭs*, of the nature or quality of gum. **GUMMY**, a. *-mĭ*, adhesive; consisting of or resembling gum; formerly in *familiar slang*, thick; clumsy; puffy. **GUMMINESS**, n. **GUM-LAC**, *-lāk*, resinous substance exuded from the body of certain insects, chiefly upon the banyan-tree; the *Aleuritis laccifera*, ord. *Euphorbiacæ*, furnishes gum-lac in Ceylon. **GUMMIC ACID**, an acid formed from gum. **BRITISH GUM** or **DEXTRINE** (see both these titles). **GUM-TREE**, species of *Eucalyptus*: see **EUCALYPTUS**; **TUPELO**.

GUM: general term applied to certain exudations from trees and plants, very various in chemical characters and general properties. In its strictest sense, gum is a substance which dissolves in water, forming a transparent mucilage; it is insoluble in ether, alcohol, and oils, either fixed or volatile, and is convertible into oxalic acid by the action of sulphuric acid. The gums belonging to this class are:

1. *Gum Arabic*, gathered from the stems of *Acacia Arabica* and *Acacia vera*, two leguminous trees in n. Africa, and in some parts of Asia. It varies in color from light straw to garnet red, and is more or less transparent: the lightest is always the best. It is exported from Barbary and Turkey.

2. *Barbary Gum*, a dark-colored variety, also exported from the Morocco coast. It has some qualities which render it particularly valuable to confectioners, in the manufacture of lozenges, etc. It is the produce of another species of acacia, *A. gummifera*.

3. *Gum Gedda*, inferior quality of Barbary gum.

4. *Gum Senegal* is in fine large, round tears, generally larger than the finest Gum Arabic; it is darker in color, being a sherry brown, with sometimes a slight pinkish tint on the surface of the drops or tears. It is found generally in the tropical parts of the w. coast of Africa, and is yielded by two species of acacia, viz., *A. Senegal* and *A. Seyal*. It is much valued for dressing various textile fabrics, such as muslins and silks, and is used by confectioners for the finest kinds of lozenges, etc.—The *Acacia Arabica* is found also in the E. Indies, and is supposed to yield, with other species, the following gums known in commerce.

5. *Gum Gattie*, produced in the Deccan, Concan, and in Gujrat; exported largely.

6. *Gum Babool*, inferior gum, from Bengal.

7. *East Indian Gum*, moderately good variety, from Bombay.

8. *Gum Oomrawuttee*, inferior variety, from the province of Oomrawuttee.

These E. Indian gums all are dark colored, and much inferior to those produced in Africa; they are, however, ex-

GUM.

tensively exported: over 200 tons are annually received into the ports of London and Liverpool.

The gums above described consists principally of a material which chemists have called *Arabin*, as the chief constituent of Gum Arabic. The following are gums of another class, in which a material, called *Bassorin*, from its being noticed first in an analysis of *Gum Bassora*, is more or less present:

1. *Gum Tragacanth*, or Dragon, yielded by the leguminous shrub *Astragalus tragacantha*; it was known to the ancient Greeks under the name *tragakantha*. The finest pieces are in flakes, from an inch to an inch and a half in length, and from half an inch to an inch in width. This gum is more or less white, and nearly opaque, that which is whitest and most opaque being the best. It is only partly soluble in water, forming a white paste, instead of a transparent solution; with vinegar or dilute acetic acid, it forms a similar paste, and is a valuable cement, holding light materials with great tenacity. It is used as a stiffening material for various textile fabrics, and is much valued for this purpose, where gloss is not desirable. We receive it chiefly from Smyrna and Constantinople. It is produced mostly in n. Persia and Asia Minor.

2. *Gum Kuteera*, yielded by *Sterculia urens* on the Coromandel coast; now seldom exported.

3. *Gum Bassora*, is exported in small quantities from Bassora; hence its name; but though long known in commerce, it has not been satisfactorily determined what plant produces it.

4. *African or Sierra Leone Tragacanth*, occasionally exported in small quantities from w. Africa; produced by *Sterculia tragacantha*.

Besides the true gums, there are the GUM-RESINS, much more mixed in their chemical constituents; in general, however, they consist of certain resins soluble in alcohol, and of the true gum, so that it requires both water and alcohol to dissolve them entirely. They are used chiefly in medicine and perfumery, and may be said to form a connecting-link between the true gums and the true resins, commercially speaking. The principal are:

1. *Gum Asafetida*: see ASAFETIDA. 2. *Gum Benzoin* of Benjamin: see BENZOIN. 3. *Gum Styrax* or *Siorax* another sweet-scented gum-resin, produced by *Styrax officinalis* in Turkey in Asia; usually liquid, of the consistence of treacle, and a blackish or dark-gray color. 4. *Gum Sagapenum*, another medicinal gum with unpleasant garlic-like odor, dark brown color, and soft consistency. It is not known what plant produces it, but a *Ferula* is generally supposed. 5. *Gum Galbanum*: see GALBANUM. 6. *Gum Opopanax* yielded by the roots of another umbelliferous plant, *Opopanax chironium*: it comes from the Levant in reddish-yellow lumps which have a disagreeable smell: its only use is in medicine, chiefly for plasters. 7. *Gum Ammoniacum*: see AMMONIACUM. 8. *Gum myrrh* a very sweet-smelling gum resin, which exudes from the stems of an Abyssinian shrub, the *Balsamodendron myrrha*. Two distinct kinds are known

GUM—GUMBINNEN.

in commerce, the Turkish and the E. Indian; the former is the best. They are both in irregular-shaped small lumps, rarely exceeding the size of a walnut, of reddish-brown color, rather lighter in the Turkish sort. Considerable quantities are used in medicine, and in perfumery for dentifrices, washes for the teeth, etc., in consequence of its being supposed to possess considerable antiseptic properties, and for the agreeable odor that it imparts to the breath. 9. *Gum Scammony*.—This is obtained from incisions made purposely in the crown of the great tap-root of the *Convolvulus scammonia*, which is bored for the purpose. It is of dark sap-green color, inclining to greenish-gray, in large and small cakes, and in irregular fragments. Its use is extensive as a mild and safe purgative for children, but scarcely any drug has been so uncertain in operation, owing to its excessive adulteration by the Turks previous to its shipment. This has now been obviated by exporting the root itself.

Many other gums are known, but these are known in commerce and used in the arts, manufactures, and in medicine. Many also of the true resins, as copal animi, etc., are called gums, but they are strictly *resins*: see RESINS.

Gum substitutes are manufactured from wheat starch, farina or potato-starch, sago-flour, and other feculas, by baking or roasting, to convert the starch into Dextrine (q.v.). This is now an important manufacture in which a large amount of capital is engaged. These products are much used in dressing calicoes and other fabrics; also as substitutes for the more expensive gums in gumming paper, as in the case of postage and receipt stamps which are made adhesive by dextrine. For this and some other purposes, the *gum substitutes* are superior to the real gums, as they are easily dissolved, and can be spread more equally over a smooth surface.

GUM, n. *gũm* [Dut. *gumme*; Germ. *gxumen*, the palate: prov. Sw. *gummsa*, to chew with difficulty and slowly]: fleshy matter surrounding a tooth; the sockets of the teeth. GUM-BOIL, a boil on the gum. It is an Abscess (q.v.) near the root of a tooth, discharging itself toward the mucous membrane of the gum; usually superficial, but sometimes more deeply seated in connection with the bone, and causing considerable deformity, with risk of Caries (q.v.) or Necrosis (q.v.). Gum-boil should be treated in the first instance, by simple protection against cold and external injury; but as soon as the presence of matter can be ascertained, it is usually good practice to give vent to it by a free incision.

GUMBINNEN, *gũm-bĩn'nèn*: a thriving town of the kingdom of Prussia, province of Prussia, on both banks of the Pisa, one of the affluents of the Pregel, 68 m. e.s.e. of Königsberg. It was regularly laid out 1724, and owes its rise and prosperity in great measure to the settlement here of many Protestants, chiefly from Salzburg, driven from their homes by religious persecution. Among other institutions, the town has a gymnasium, a public library, three

GUMBO—GUN.

Protestant churches, and two hospitals. Woollen-cloth weaving, brewing, and distilling, are the branches of manufacture. Pop. (1880) 9,530; (1890) 12,213.

GUM'BO, or GOR'BO, or GOR'BO: see HIBISCUS.

GUM'MEL: town of Africa, state of Bornu, lat. $12^{\circ} 38'$ n., and long. $9^{\circ} 21'$ e. Dr. Barth at his first visit to G., 1851, found it a flourishing town, the great entrepôt for natron-trade, with a weekly market, at which were 300 stalls offering for sale all sorts of clothing, tools, pottery, victuals, cattle, horses, etc.; pop. 10,000; but on his return-journey, 1854, he found that it had suffered severely from civil wars, and was then in a state of at least temporary decay.

GUM'MING: disease analogous to *Canker* (q.v.), and like it, very destructive to fruit-trees, but confined to those the sap of which readily produces much gum; as the cherry, plum, peach, apricot, and almond. It is supposed sometimes to originate in wounds, in which a morbid exudation of gum takes place; but it appears more frequently occasioned by severe frosts, and to be much dependent on causes which induce a general unhealthiness. It generally terminates in the destruction, not merely of the branch in which it originated, but of the whole tree, though trees in which it is in sure progress sometimes live for years, and meanwhile produce large crops of fruit. A small fungus (*Nectria coccinea*), often supposed to be the cause of gumming, is more probably its consequence.

GUMPTION, n. *gũm'shũn* [old and prov. Eng. *gaum*, to observe, to understand: AS. *geomian*, to take care of: comp. Gael. *cuimeasach*, moderate, temperate]: in familiar language, capacity; shrewdness; common-sense; tact.

GUMRI, *gũm'rẽ*: old town of Russian Armenia, on the site of which the important city and fortress of Alexandropol have been built. The latter name, in honor of Empress Alexandra, is now the most frequent. The site is on the old Turkish frontier, on the high-road to Erivan, 60 m. n.w. of that town. Alexandropol is 5,860 ft. above sea-level, and here the cold is so intense that men are often frozen to death in the fields. Fortifications, erected 1837 by Nicholas I., rank next to Kars in strength in that part of Asia. Pop. (1832) about 300; (1880) 20,600; (1897) 32,018.

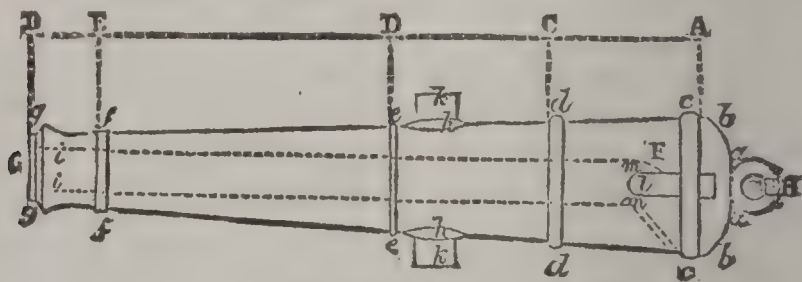
GUMTI, *gũm'tẽ*: river of India, remarkable, as its name is meant to express, for its windings. It rises in a small lake, lat. $28^{\circ} 35'$ n., and long. $80^{\circ} 10'$ e., and after a s.e. course of 482 m., enters the Ganges from the left, lat. $25^{\circ} 29'$ n., and long. $83^{\circ} 15'$ e. It is navigable for inland craft as far up as Lucknow, more than 300 m. above its confluence with the Ganges. At Jaunpore, about 56 m. from the Ganges, it is spanned by a bridge of 16 arches.

GUN, n. *gũn* [OE. *gonne*; mid. L. *gunna*, a war-engine, a fire-tube: F. *guigner*, to wink or aim with one eye; *guigneur*, an aimer with one eye as a gunner; comp. Gael. *gunna*, a weapon to project or discharge with] any firearm, except a pistol and revolver, a fowling-piece; an instrument

GUN.

for throwing shot by means of gunpowder, as a musket, a rifle, a cannon. GUN-BARREL, the tube of a gun. GUN-FIRE, in certain places, a morning and evening gun fired at fixed times. GUN NAGE, *n.* *-nāj*, the number of cannon a ship carries. GUN'NER, *n.* *-nēr*, one appointed over guns or ammunition; an artilleryman (see below). GUN NERY, *n.* *-ī*, the art of managing guns, mortars, etc.; also the science (see below). GUN-METAL, an alloy of nine parts of copper with one of tin. GUNPOWDER, *n.* *-powdēr*, the chemical composition used in guns, etc., composed of nitre, sulphur, and charcoal (see below). GUN'SHOT, *a.* caused by the shot from a gun, as a wound: *N.* reach or range of a gun. GUNSMITH, *n.* one who makes or repairs guns. GUN'STOCK, *n.* the wood into which the barrel of a fowling-piece, musket, or rifle is fitted. GUN-TACKLE, *-tāk l*, pulleys and ropes used on board of ships to secure guns, or to run them out of the ports. GUNWALE, *n.* *gŭn ěl* [*gun*, and *wale*, which see]: the upper timber of a ship's side from the half-deck to the forecastle—so named because the upper guns were pointed from it—spelled also GUNNEL. TO BLOW GREAT GUNS, to blow violently. SURE AS A GUN, as certain as that a gun will go off when the trigger is pulled. A GREAT GUN, a man of eminence and mark, especially as a preacher or public speaker. AIR-GUN: see AIR-GUN.

GUN: in most general application, firearms of any description; but in the more restricted and technical sense, Cannon (*q.v.*). A gun is a frustum of a right cone, with a cylinder excavated round the axis, to serve as a bore. Close home to the end of this cylinder, the powder is driven, and outside it is the ball to be expelled. The several parts are shown in the figure below.



32-pounder Gun:

AB, length of gun; AC, first reinforce; CD, second reinforce; DE, chase; EB, muzzle; FG, bore; GH, axis; *aa*, neck; *bb*, breech ogee; *cc*, base ring; *dd*, first reinforce ring; *ee*, second reinforce ring; *ff*, muzzle asragal; *g, g*, muzzle moldings; *h, h*, shoulder of trunnions; *ii*, diameter of bore, or calibre; *k, k*, trunnions; *l*, vent; *m*, breech; *n*, button.

The trunnions are cast in one mass with the piece, and are placed in the second reinforce in such a position that the breech-end of the gun outweighs the muzzle. Their axis is generally about half their diameter below the axis of the piece. This locality has several conveniences; but for the maximum of steadiness in the recoil, it has been shown that the axes of the trunnions and of the gun should exactly intersect. The use of the trunnions is to suspend the cannon on its carriage in such a manner that it may be readily depressed or elevated, but so that it shall have no

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horizontal motion which is not shared by the whole carriage.

The vent or touch-hole, the channel through which the charge is fired, is a small cylindrical orifice leading at an angle from the breech of the bore toward the base ring. The explosion within reacts with great force on the lower portion of the vent, and in case of rapid or long-continued firing, soon honeycombs the iron or brass, often dislodging considerable fragments. This, besides diminishing the regularity of the action of the powder on the projectile, would involve danger of bursting if permitted to any great extent. The gun so affected is therefore *bouched*, that is, has a new vent constructed. The process consists of drilling a female screw, of larger than the required diameter, in the metal of the gun. Into this matrix, a bar of pure copper is screwed (copper being the metal least liable to fuse under the intense heat of ignited gunpowder), and the vent is then drilled through the copper. Sir A. Dickson devised the following simple mode: he rammed a cartridge of sand firmly into the breech, then filled the vent and all the interstices with molten copper, and had only to bore a hole through the latter to complete the operation. In cases of great urgency, even this simple procedure may be shortened by the insertion of the stem of a tobacco-pipe during the filling; the pipe, when removed, leaves a perfect vent.

With reference to rifled cannon, see some particulars under ARMSTRONG GUN: for fuller details see RIFLED ARMS. For some details as to various kinds of heavy guns, see CANNON: LANCASTER GUN: MORTAR: SHELL-GUN: ETC. For the history of guns and gunpowder, see FIREARMS. For the ordnance now in most frequent military and naval use, see list under CANNON. For the various kinds of small arms, see ARQUEBUS: MATCHLOCK: PISTOL: REVOLVER: RIFLED ARMS. See also ARTILLERY: GUN-CARRIAGE: GUN-MAKING: GUNNERY: GUNPOWDER: MACHINE GUN: PNEUMATIC DYNAMITE GUN.

GUN, SPORTING: a firearm, used for shooting birds and other game; with smooth bore, and generally double-barrelled. The modern sporting gun is breech-loading and has the 'drop-down' action. Many patents have been taken out for different details of this action, invented in 1825 by Lefauchaux. It consists of a piece of steel 2 or 2½ inches long, called the 'lump,' securely fastened to the under side of the breech end of the barrels. The fore end of this lump is hinged by a pin to corresponding parts of the breech-piece; on this hinge the barrels are moved, thus opening or closing the breech. The lump is usually in two divisions, each of which fits into slots in the breech-piece, and both parts have notches into which a bolt snaps when the breech is closed.

The so-called 'hammerless' sporting guns have invisible hammers and are fitted with a safety-check on the trigger, or an automatic action which locks the hammer.

The lock of the sporting gun is of the rebounding style,

GUN-BOAT.

the hammer being thrown back automatically to half-cock after firing, thus preventing accidental discharge.

For loading, the breech of the piece is placed under the right arm, the mechanism which holds the barrel firmly in place is operated, and the barrel, being released, drops down on a swivel and is ready for the insertion of the cartridges. After these are inserted the barrels are brought down by a quick motion, with sufficient force to bring the top of the barrels in line with the breech-pin, and the piece is ready for firing.

A mainspring on the pull of the trigger explodes the cap in the cartridge by a hammer, working either directly through a hole in the breech or by a detached rod inserted in the hole.

Various attachments for ejecting spent cartridges have been invented. One of these consists of a lever, at the right side of the piece, which controls the bolt that holds the barrel in its place. By moving this lever the bolt is released and at the same time a shell extractor which ejects the spent cartridge is set in motion.

The barrels of sporting guns are generally hand-forged from a rod of composite material consisting of iron of two distinct varieties, or of iron and steel. Some gun-irons contain 70 per cent. of steel. The rod of gun-iron is built up of alternate layers of hard and soft metals, and sometimes is twisted upon itself before being welded into a barrel. Steel barrels are drilled from solid rods of best mild steel, or drawn from blanks in the same manner as ordinary tubes. Cold-drawn steel barrels, formerly used, proved too expensive.

The standard size of the modern shot-gun is 12 bore—i.e., twelve spherical leaden bullets of the same diameter as the interior of the barrel will weigh 1 lb. avoirdupois. Formerly 16 and 20 bores were preferred. In the United States and Canada 10 bores are common, but 8 and 4 bores are used for wild-fowling.

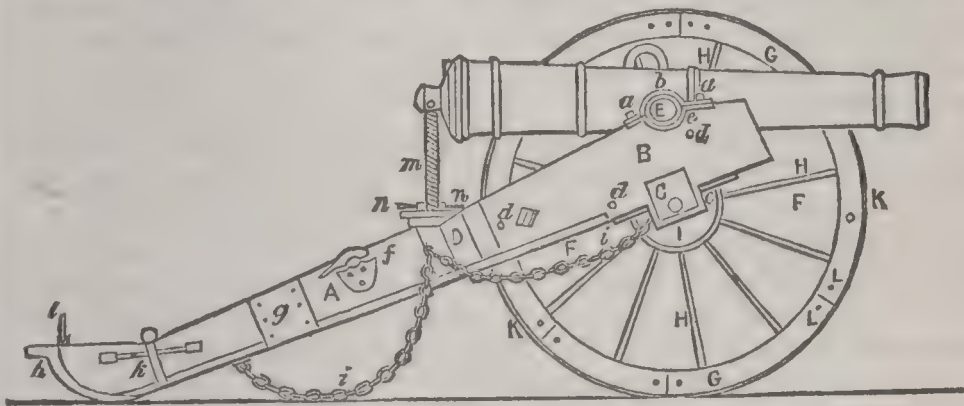
Smokeless explosives are now in general use by sportsmen in all countries.

GUN'-BOAT: vessel heavily built, and armed with one or more guns of large calibre. Not being of great size, it is capable of running close inshore or up rivers, and has chance of escape from being hit by a larger vessel at the long range which the carrying power of its guns enables it to maintain. Gun-boats in their more modern form are mastless vessels mounting one large gun in the bow (sometimes carrying more than one gun), and propelled by an engine with single or twin screws. The gun is pointed by means of the helm or the screws, and such a G.-B. is in fact a floating gun-carriage. Some of these boats carry an armor-piercing gun of 18 tons, on a draught of only 4 ft. But they have been designed to carry 35-ton guns, or heavier. In 1890, there were attached to the British navy 114 of these vessels, of which 43 were called third-class, and are intended for coast defense alone. A small flotilla of such gun-boats, protected only by their small size, would be in coast defense a formidable opponent even for iron-clads. At the beginning of the century the United States

GUN-CARRIAGE.

more than over 250 of these vessels; but the 'gun-boat system' was soon abandoned, though during the war of secession they were again largely used. Some European navies are well provided with gun-boats.

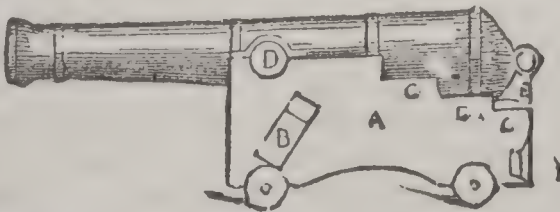
GUN-CARRIAGE: carriage for bearing and moving heavy guns; very important in the equipment of each piece of ordnance. It requires to be of great strength, and at the same time of considerable weight, in order that the whole apparatus—gun and carriage together—may not be driven backward by the recoil in firing. Field-gun carriages have, besides, to bear an enormous strain in passing at a rapid pace over broken, uneven, or rocky ground. To provide for this severe wear and tear, every part is fitted with the utmost precision, made of well-seasoned material, and on strict mechanical principles. Carriages are of various kinds, according to the service required; but the leading kinds—viz., those for field service, and those for garrison or ship duty—are represented in the following figures, in which the names of the principal parts also are



Field Gun and its Carriage.

A, block or trail; B, cheeks or brackets; C, axle-tree; D, ogee; E, trunnion holes; F, wheel; G, felly; H, spokes; I, nave; K, tire or streak; L, rivets; a, eye or capsquare bolts; b, capsquare; c, axle-tree bands; d, heads of transom-bolts; e, trunnion-plates; f, port-fire-clipper; g, locking-plate; h, trail-plate; i, locking-chain; k, trail-handle; l, handspike ring; m, elevating-screw; n, handles of elevating-screw.

given. When the field-gun is to be moved, the trail-plate is hooked to the LIMBER (q.v.), which converts the gun-carriage and limber into a four-wheeled vehicle, capable of conveying the gun, its tools and ammunition, and sev-



Ship, or Garrison Gun and Carriage.

A, side or bracket; B, transom; C, steps; D, trunnion-hole; E, quoins.

eral of its gunners. For certain species of gun-carriages, see TRAVERSING PLATFORM. Among modern inventions of war is the Moncrieff or elevating gun-carriage, in which the gun is poised at the end of a lever pivoted on the car-

GUN-COTTON.

riage, and balanced by a heavy counter-weight. Before firing, the gun is raised by mechanism; when fired, its own recoil drives it down upon the carriage. This arrangement enables gun and gunners to lie concealed behind a parapet until the moment of discharge.

GUN-COTTON: compound obtained from cellulose, $C_{18}H_{30}O_{15}$ (or $nC_6H_{10}O_5$) by treatment with nitric acid. It may have various compositions according to its degree of nitration; the three following are known: $C_{18}H_{28}(NO_2)_7O_{16}$, voluble in ether and glacial acetic acid; $C_{18}H_{22}(NO_2)_8O_{16}$, soluble in ether and alcohol mixed, and in glacial acetic acid; $C_{18}H_{21}(NO_2)_9O_{15}$, insoluble in alcohol and ether mixed, but soluble in ethylic acetate. The latter is the compound of most value as an explosive, and the U. S. govt. standard exacts a degree of purity of 90 per cent. by the ether-alcohol solubility test. The fibre, in undergoing this change, increases about 70 per cent. in weight, and acquires new properties. Although scarcely differing in appearance from unchanged cotton, it may be distinguished from it by its harshness, by the crepitating sound which it yields when pressed by the hand, by its having lost the property of depolarization which ordinary cotton possesses, and by its electric condition. Iodine dissolved in a solution of iodide of potassium affords a certain means of distinguishing explosive from ordinary cotton. If the former is moistened with this iodine solution, and a little dilute sulphuric acid is subsequently added (one part of the acid to four of water), a yellow color is evolved; while ordinary cotton wool, when similarly treated, assumes a blue color. Its most remarkable property is, however, the facility with which it takes fire, and its rapid and complete combustion. The most recent experiments of Prof. Abel, carried on with elaborate care for a number of years at the Woolwich Arsenal, England, have resulted in further improving the manufacture, and in determining more accurately the properties of gun-cotton.

Professor Abel has proved that the more thoroughly gun-cotton is compressed, the more perfectly can its action be controlled, and it is now generally used in compact disks for mining purposes; he found that it is sympathetic, so that, if gently ignited by a spark, in the form of yarn, it smolders slowly away; if by a flame, it burns up rapidly; and if fired in the compressed state by a detonating fuse, it explodes with great violence, even when unconfined. Although, as a rule, non-inflammable and non-explosive in the wet state, yet, when fired in this condition with fulminate of mercury and a little dry gun-cotton or gunpowder, it explodes with as much violence as when dry.

While gunpowder does not explode at a lower temperature than 600° F., gun-cotton has been known to do so at 277° F., and cannot be heated to 400° F., without explosion. Gun-cotton produces neither smoke nor fouling when fired, and does not heat the gun so much as gunpowder, though, by the rapidity of its explosion, it strains the barrel more. Firmly confined, it exerts a destructive effect equal to about five times that of gunpowder,

GUN-COTTON.

A new explosive, called 'blasting-gelatine,' was recently patented by M. Nobel. It is obtained by mixing 7 per cent. of gun-cotton with 93 per cent. of nitro-glycerine, and the substance thus formed, being explosive throughout, is very powerful. By adding 10 per cent. of military gun-cotton to the blasting jelly, Prof. Abel has produced a more solid and still more powerful explosive.

The general history of the discovery is here given. Bracconnot discovered the compound 1833 in treating paper and starch with nitric acid; about the same time Pelouze prepared it from starch. Both discoverers experimented crudely, and it was not until 1846 that Schönbein and Böttger independently announced the discovery of it as a new explosive. The inventors combined and took out patents. Many other chemists worked on the new compound, and about 1848 the interest in the work assumed a phase of positive excitement. In this year fatal explosions in England and France showed its dangerous nature. Capt. Von Lenk, an Austrian officer, studied the new compound, and perfected the process of manufacture. His improvements are thus summarized: 1. A perfect cleansing and drying of the cotton. 2. The use of the most concentrated and purest acids procurable commercially. 3. Steeping the cotton a second time in a mixture of the strong acids. 4. Continuance of this steeping for 48 hours. 5. A thorough purification of the gun-cotton from free acid by washing in a running stream for several weeks. This may be supplemented by washing in a weak solution of potash, though this is not absolutely necessary.

After experiments from 1849-53 the Austrian govt. bought the Böttger-Schönbein patents, and in 1853 the first well ordered factory was erected at Hirtenberg, near Vienna, under Von Lenk's superintendence. In 1865 Abel made the discovery above alluded to that gave gun-cotton its present value, and exempted it from liability to spontaneous explosion. It consists in 'pulping' or cutting up the fibre so as to admit of perfect washing to free it from acids. All the gun-cotton of the world is now made under the Von Lenk-Abel processes.

At the United States factory at Newport, R. I., the following are the steps of the method employed: The cotton is first washed with weak alkali and afterward with water. It is dried and dipped into a mixture of 1 part by weight of nitric acid (1.5 sp. gr.) and 3 parts sulphuric acid (1.85 sp. gr.). After ten minutes' immersion it is removed and pressed in a hand-press and placed in a stone jar and cooled by ten hours' standing in a cooling trough. It is then treated in a centrifugal drying machine, is washed with water, again treated in a centrifugal drier, boiled with weak carbonate of soda solution, dried in a centrifugal drier, the process repeated with plain water, and then it is ready for pulping. The pulping-machine, the same as used in making paper-pulp (see PAPER), cuts the fibres while mixed with water into minute pieces, so as to form a pulp. It now receives its final washing, which is effectual only because of the pulping. It is

GUNDAMUK—GUNNEL.

'fortified' by the addition of a little precipitated chalk, caustic soda, and lime, and mixed with enough water to keep it of a pulp-like consistency. It is molded into any desired shape and subjected to hydraulic pressure. Its principal use is for torpedo practice. See GUNPOWDER: NITRO-GLYCERINE: EXPLOSIVES: FULMINATES.

GUNDAMUK, *gũn-dâ-mũk'* (*Gandamak*): village of Afghanistan, where, during the retreat from Cabul 1842, a British force within 28 m. of Jelalabad was massacred, to the number of 100 soldiers and 300 camp-followers, only one man escaping. Here also a treaty with Yakoob Khan was signed 1879. See AFGHANISTAN.

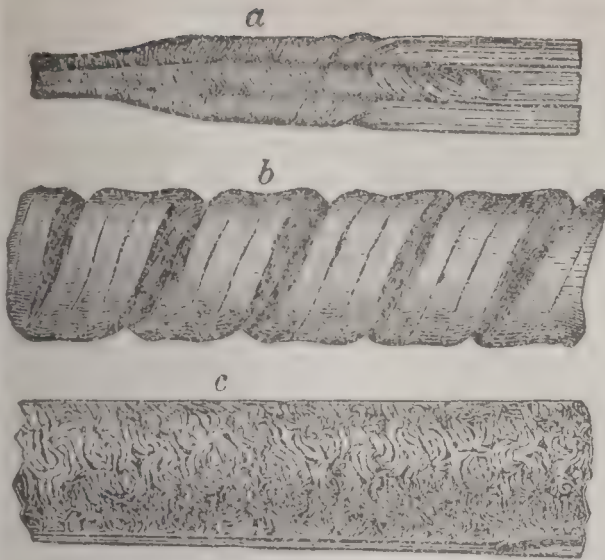
GUNDUK, *gũn-dũk'* (the *Great Candak*; the Little G. being a tributary of the Gogra): river of India, joining the Ganges from the left or n. side, opposite to Patna, after a course of about 400 m. It rises among the Nepalese Himalayas; after a course of 200 m. it becomes navigable for boats of considerable burden. Near this point, the river touches the British territory, dividing it for 15 m. from Nepal.

GUNDULITSCH, *gũn'dũ-lich*, or GONDOLA, *gon'do-lã*, IWAN: most celebrated Serbian poet of earlier times; 1588, Aug. 8 – 1638, Dec. 8; b. in the town of Ragusa; son of Francis G., the historian. After he had completed his primary education and philosophic studies under the Jesuits, he applied himself, at the age of 21, to jurisprudence, making such rapid advances, that in spite of his youth, he was intrusted with the first offices of the Ragusan republic. On the bicentenary anniversary of his death, a grand requiem was sung in memory of the poet, in the Academic Church of Agram.—G.'s poetical works, lyrical, dramatic, and epical, are a faithful mirror of the stirring time in which they were composed. He was the earliest dramatic writer of the Slavic race, and the theatre of Ragusa, on which his pieces were performed, was the first Slavic theatre. His greatest and most celebrated work is an epic, *The Osmanli*, in 20 cantos, in which he sings the deeds of Osman II, and the fame of the Poles and their king, Wladislaw IV., in the campaign of 1621 (published, Ragusa 1626); the latest edition is that of Gaj (Agram, 1844). Of his dramas, may be mentioned *Ariadne*, *The Rape of Proserpina*, *Galatea*, *Diana*, *Armida*, *The Sacrifice of Love*, *Ceres*, *Cleopatra*, *Adonis*, and *The Coral*; of his other poems, *Hymn on the Greatness of God*, and *The Tears of the Afflicted Son*. G. made several translations from the Italian poets.

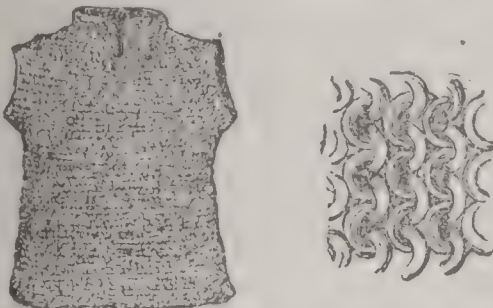
GUNDWA'NA: see GONDWANA.

GUNJAH, n. *gũn'jã*: in *India*, the name given to the India hemp, gathered when in flower and containing its resin, and dried.

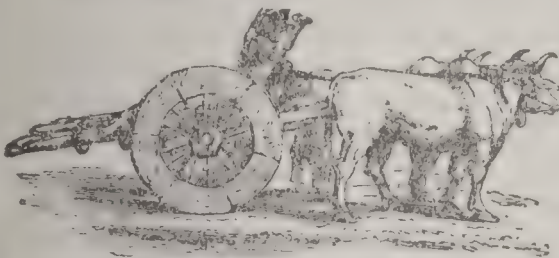
GUNNEL, *gũn'el* (*Gunnellus* or *Muraenoides*): genus of fishes of the Blenny (q.v.) family, of more elongated form than the true blennies. The species are numerous. The spotted G., called in England BUTTERFISH, is used there as bait. See STROMATEUS.



Gun-barrel. — *a*, Gun-barrel iron, twisted and laid into a riband; *b*, Portion of gun-barrel coil; *c*, Portion of silver-steel Damascus barrel.



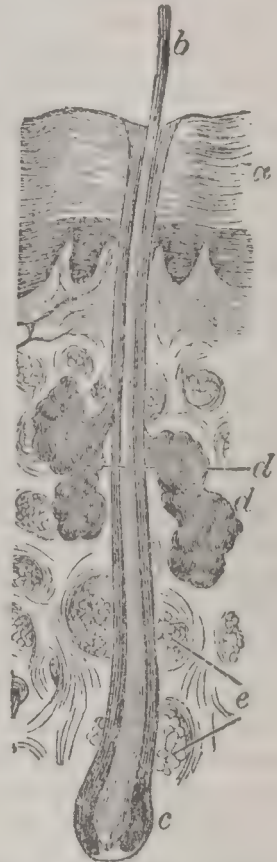
Habergeon, and Detail of Links.



Hackery or Bullock-cart.



Gynobase.—Frnit of *Myosotis*: *a*, *a*, Achenæ or nuts; *c*, Calyx; *g*, Gynobase



Hair.—Vertical section of Skin, showing hair-follicle: *a*, Epidermis; *b*, Hair; *c*, Hair-bulb; *d*, *d*, Oil-glands; *e*, Fat-cells.

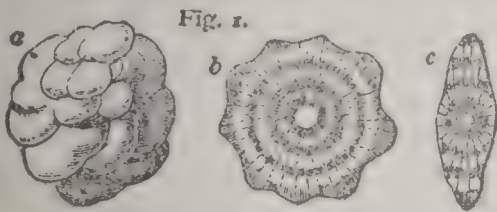


Fig. 1.

casion, showing the radiating nucleus and concentric layers. Fig. 2. *a*, Section of hailstone, with minute pyramids on its surface; *b*, *c*, *d*, *e*, Fragments of ditto, when burst asunder.

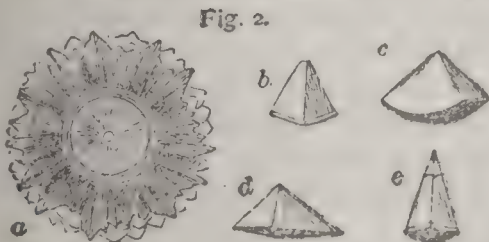


Fig. 2.

Forms of Hailstones.—Fig. 1. *a*, Hailstone which fell at Bonn in 1822: diameter 1 1-2 inch, weight 300 grains; *b*, *c*, Sections of differently shaped hailstones which fell on the same oc-



Haddock (*Gadus* or *Morrhua Eglefinus*).

GUNNER—GUNNERY.

GUN'NER in the Army or Navy: soldier or seaman who is employed in loading, pointing, and discharging a piece of ordnance. In the British army, a G. is the private soldier of the corps of artillery. *Master-gunners* are pensioned sergeants of artillery, placed in charge of the stores in small towers or forts.—In the British navy, the *gunner* ranks first among the warrant-officers, and next in order to the navigating sub-lieut. in regard to taking command of a ship. A G. rises from before the mast by steadiness, sobriety, and intelligence. His duties are important: he has charge of all powder and artillery stores on board, and is bound to see that the guns are always fully equipped for action. In exercising with the guns the gunner is instructor of the sailors, and, under the captain, is responsible for their efficiency. The *gunner's-mate* is assistant to the gunner, and is second among the petty-officers. *Seamen-gunners* are continuous-service sailors, trained in gunnery and great-gun exercise. One has the direction of each gun, with ordinary seamen under him to perform the heavy part of working it.

In the U. S. army, there is no regular grade of officer known as G.; the G. is the member of the gun-squad in the artillery, who, in his turn, points and fires the gun.—In the U. S. navy, a G. is a warrant officer who, under the officers of ordnance, has in charge the battery, small arms, and magazines, and aids in training the soldiers who handle the guns. His position and duties are important, and require intelligence and training.

GUNNERY, *gún'ér-î*: art or science of managing guns, usually great guns. Ignorance of the laws of gravity and of other physical facts affecting the flight of projectiles, prevented any correct theory of gunnery in the earliest ages of artillery. The first author professedly treating on the flight of cannon-shot was Nicolas Tartaglia, distinguished Italian mathematician, who, 1537, published his work, *La Nuova Scientia*. He had no practical acquaintance with his subject, but his guesses were shrewd and often marvellously near the truth. Among other things he ascertained that no portion of the track described by a ball is a right line, and as a practical aid to artillerists, he devised the gunner's *Quadrant* (q.v.). After Tartaglia, many philosophers, especially of Italy, theorized on the question, and various tables of ranges, elevations, charges, etc., had been published, all more or less fallacious, when a nearer approach to accuracy appeared in Galileo's *Dialogues on Motion*, 1638. The officers who had charge of artillery in actual use had too little scientific education to deduce theory from practice; and till the time of Robins, who wrote 1742, but four working gunners—Collado, Browne, Eldred, and Alderson, of whom the last three were Englishmen—have left treatises of any value on the use of their weapons.

Galileo, in his contributions to physics, had shown that cannon-shot, or any other projectiles, being affected by the downward force of gravity, would travel in the curve of a parabola, unless affected by the resistance of the air.

GUNNERY.

The philosopher pointed out modes by which the disturbances caused by this resisting medium might be ascertained; but subsequent writers, with the exception of Newton and Bernouilli, till the time of Robins, chose to assume that the atmospherical resistance was but nominal, and boldly asserted that all shot described parabolas in their course. In 1742, Benjamin Robins, who must be considered the real founder of the science, published his *New Principles of Gunnery*, the result of long and numerous experiments. He treated of the atmospheric resistance, of the force of gunpowder, of the effects of varying length and weight in guns, and of almost everything which related to the motion of projectiles, carrying the theory of gunnery nearly to perfection. As one result of his experiments, Robins established the law that common shot encountered a resistance from the air during their passage, which increased as the square of the velocity, or very nearly so; and that their courses differed widely from parabolas. By means of the Ballistic Pendulum (q.v.), he measured the speed of balls at the very cannon's mouth. Euler, in the later part of the 18th c., added much to the knowledge of the subject by his commentaries on the work of Robins; as did also the mathematician Hutton.

The theory of G., so far as it can be deduced from the universal laws of motion, without regard to the resistance of the air, falls under the more general head of Projectiles (q.v.). But except in firing bombs, which from their low velocity are not so much affected by the resistance of the air, the mere mathematical theory is of little service. All the real practical rules have been deduced from experiment. The following are a few of the more important results thus arrived at.

For a given charge and weight of projectile, there is a certain length of bore that gives the greatest velocity; the cause being, that with a less length some of the powder is discharged undecomposed, and with a greater, the combustion is finished before the ball leaves the muzzle, so that it has to contend with the friction of the gun without receiving additional impulses. Increase of length, accompanied by proportionate increase of charge, gives increased velocity; but the greater velocity is only in proportion to the cube root of the increased length.

The resistance of the air does not arise merely from the projectile having to displace its own bulk of it as it advances; for in the case of a body moving with great velocity, the air becomes condensed in front of it, while that behind is highly rarified. The displaced air behind does not return freely to fill up the vacuum, until the speed of the ball is reduced to 1,400 ft. per second; the maximum profitable velocity is calculated to be 1,600 ft., and that, or any higher speed, is believed to be reduced to 1,400 ft. after a course of 400 feet.

The resistance offered to bodies by the air is as their surfaces, i.e., in the case of round or cylindrical shot, as the squares of the diameters; while the power of the bodies themselves to overcome resistance is as their weights, or as

GUNNERY.

the cubes of their diameters. Of course balls of like size but different density will produce widely different results. Hence the greater range of solid as compared to hollow shot. Solid shot fired with equal velocities and elevations, range as their weight, the heavier overcoming atmospheric resistance better than the lighter. Shot of equal weight and diameter will range according to their velocities; but not in direct proportion, for the retarding power varies as the square of the velocity. Velocities of shot of equal diameter are as the square roots of the charges.

The diminution in speed caused by atmospheric resistance may be judged of from the following table of the speed of a 32-pounder at different parts of its course; it being premised that a body in vacuo, once started, should move *ad infinitum*, without decrease of velocity:

Initial velocity,	1,600 ft. per second.
Velocity, 500 yds from gun, .	1,126 "
" 1,000 "	1,000 "
" 1,500 "	608 "
" 2,000 "	465 "
" 2,500 "	367 "

Action and reaction being always equal and in opposite directions, the explosion of the gunpowder acts with equal force upon the ball and upon the cannon from which it is discharged, the former demonstrating this in its range, and the latter by its recoil. This recoil has to be guarded against as much as possible, either by the weight of the gun itself, or by its secure attachment to a ponderous carriage. The momentum of the recoil, being the product of the shot's weight and the velocity, is readily calculated. The common charge of a 24-pounder gun, being one-third the weight of the shot, or eight pounds, the momentum of both shot and gun, will be 1,600 (the initial velocity) \times 24 = 38,400, which divided by 5,600, or the gun's weight in pounds, gives about seven ft. as the velocity per second; if the gun is attached to a carriage, the weight of the carriage must be added to that of the gun for a divisor.

The following table exhibits the effects of varying charge and elevation on different kinds of guns: it will be understood by reference to the accompanying diagrams. The line of sight of a gun is an imaginary line drawn through the back sight on the breech and the fore-sight, a notch in the muzzle ring, or on the first re-inforce (see fig. 1, where

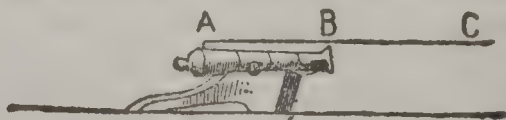


Fig. 1.

ABC is the line of sight). The fore-sight B is immovable, but the back sight A is so constructed that the notch shall be at a greater or less height above the axis of the gun. When the line ABC is parallel to the axis and horizontal, the discharge is 'point blank;' but when the back-sight is raised, the direction of the axis of the gun will be to a point more elevated than that to which the line of sight is directed, as in fig. 2, where the original impulse received by

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the shot is toward D. Consequently, by raising the back-sight, a greater elevation, and ordinarily a greater range, is given to the piece. In regard to point-blank discharge,

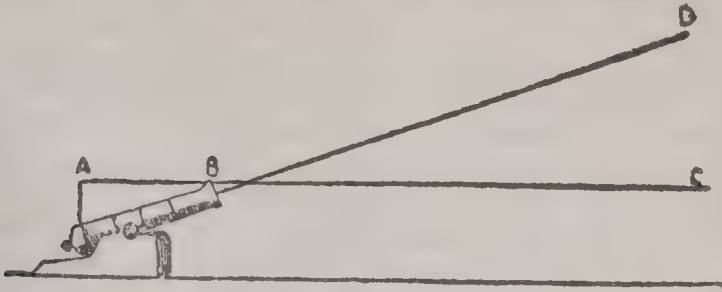


Fig. 2.

Tartaglia established the fundamental proposition that the time occupied by the ball in describing the whole trajectory or path is the same as it would require to fall by gravity from the muzzle to the ground.

Nature.	Elevation.	Charge.	Range in Yards.
12-pounder iron gun, .	Point-blank,	4 lbs.	300
	1 degree,	"	700
	3 degrees,	"	1,200
	6 "	"	1,800
12-pounder Armstrong. .	Point-blank,	1 lb. 8 oz.	330
	1 degree,	"	700
	3 degrees,	"	1,425
	6 "	"	2,440
32-pounder iron gun ,	10 "	"	3,590
	Point-blank,	10 lbs.	390
	1 degree,	"	790
	3 degrees,	"	1,500
40-pounder Armstrong .	6 "	"	2,220
	12 "	"	3,060
	Point-blank,	5 lbs.	360
	1 degree,	"	730
68 pounder iron gun, .	3 degrees,	"	1,455
	6 "	"	2,505
	12 "	"	4,470
	Point-blank,	20 lbs.	400
110-pounder Armstrong, .	1 degree,	"	950
	3 degrees,	"	1,715
	6 "	"	2,465
	12 "	"	3,400
	Point-blank,	12 lbs.	345
	1 degree,	"	680
	3 degrees,	"	1,335
	6 "	"	2,280
	12 "	"	4,035

As regards penetration, it was found by experiments against a martello tower at Eastbourne, with a range of 1,832 yards, that solid shot from the 40-pounder Armstrong penetrated into good masonry 47 to 65 inches, and from an 80-pounder Armstrong 51 to 90 inches. For other particulars relative to G., see PROJECTILES: RANGE: WINDAGE: ETC. For the important point of the rotation of a ball or bolt, see RIFLED FIREARMS.

GUNNISON CITY—GUNNY BAGS.

GUNNISON CITY: city, cap. of Gunnison co., Colo.; on Gunnison river, and the Denver and Rio Grande and the Denver South Park and Pacific railroads: 170 m. w. by n. of Pueblo, 291 m. s.w. of Denver. It is the supply depot and metropolis of the famous 'Gunnison country,' one of the richest gold, silver, and coal regions in the world, which has been worked less than 26 years (1903) The region is picturesque, watered by the Gunnison, Grand, and Otto rivers, and contains many high peaks of the Elk Mountains. Prospectors crossed the Elk Mountain range 1860, the Ute Indians drove early settlers away 1863, and sold their country to the govt. 1873, the first discovery of the precious metals in the Ruby district, 30 m. n. of G. C., was made 1879, June, and the Indians were removed to Utah and their late reservation thrown open to miners 1880. Pop. (1885) 1,427; (1890) 1,105; (1900) 1,200.

GUNNY BAGS: bags of a coarse kind of cloth or sack-ing, manufactured in India, chiefly in Bengal, whence they are largely exported. The fibre of which the cloth is made is chiefly that of the same species of *Corchorus*, which yield the jute (q. v.) of commerce. The cotton of America is mostly packed in gunny bags, of which the number exported to America from Bengal increased from thousands in 1796 to millions in 1874. Great quantities are exported also to China, Australia, and other countries. They are partly made into bags in Bengal, partly exported as Gunny *chuts* or *chuttees*, pieces of size suitable for being immediately made into bags. The manufacture of these is the great domestic industry of all the populous eastern districts of Lower Bengal. It pervades all classes, and gives occupation to men, women, and children. Boatmen employ themselves in it in their spare moments, husbandmen, palanquin-carriers, and domestic servants, being Hindus, for Mohammedans spin cotton only. It 'forms the never-failing resource of that most humble, patient, and despised of created beings, the Hindu widow, saved by law from the pile, but condemned by opinion and custom for the remainder of her days, literally to sackcloth and ashes, and the lowest domestic drudgery in the very household where once, perhaps, her will was law.' (Royle's *Fibrous Plants of India*.) Hence the very low prices at which gunny bags are sold. There are few articles of commerce so widely diffused over the globe.

GUNPOWDER.

GUNPOWDER: explosive mixture of sulphur, nitre, and charcoal. It is used in several trades, but its principal employment is in the discharge, for war or sport, of projectiles from fire-arms, and in the processes of blasting during mining or quarrying. For the history of G., see FIRE-ARMS. The consideration now requisite is as to the chemical action which takes place when G. is ignited, and then as to the manufacture.

Extreme care is requisite in securing the purity of the ingredients entering into the composition of G. The principal impurity of nitre or saltpetre is chloride of sodium, or common salt, which, in consequence of its tendency to absorb moisture from the atmosphere, would have a very injurious action on G. by weakening its power. The details of the process of purification of the nitre would be out of place in this article. The sulphur may be purified either by fusion (when the heavier impurities sink, and the lighter ones may be removed by skimming) or by distillation. The preparation of the charcoal is a most important point. It should be light and porous, should yield a very small amount of ash, especially of carbonate of potash and other deliquescent salts, and should contain little moisture. The woods yielding the best charcoal for gunpowder are black alder, poplar, spindle-tree, willow, and dogwood, the last named giving off the largest volume of gas when ignited with a given weight of nitre, and being on that account especially used for rifle powder.

A vast number of experiments have been made at different times, and, by different nations, to discover the proportions of nitre, sulphur, and charcoal best adapted for the production of different kinds of G.; and on the whole there has been great uniformity in the results, as may be seen from the following table of the percentage composition of the powder of different nations:

Kind of powder.	Char-coal.	Sul-phur.	Nitre.	Author-ity.
Austrian war powder.....	13.1	11.3	75.6	Linck.
English (Waltham Abbey) war powder, }	13.7	10.1	76.2	Ure.
Russian war powder.....	17.7	11.7	70.6	Meyer.
Italian sporting powder.....	18.2	8.6	73.2	Prechtl.
Chinese gunpowder.....	23.1	15.4	61.5	Prechtl.
United States milit. service....	14	10	76	Benton.
“ sporting.....	12	10	78	
“ blasting	18	20	62	

In the U. S. milit. service 5 kinds of G. are used; *musket* for small arms; *mortar* for field guns and mortars; *cannon* for siege-guns; *mammoth* for heavy sea-coast guns; and *hexagonal*, a recent improvement in the shape of the *mammoth*. The new *hexagonal* G., used in a 15-inch Rodman gun, has given pressures as low as 18,000 and an initial velocity of 1,600 ft., with a service charge of 100 pounds and a 450-pound shot.

The chemical processes which occur in the ignition of G. are commonly described as follows: When the powder is ignited, the oxygen of the nitre combines with the charcoal or carbon to form carbonic acid, the potas-

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sium combines with the sulphur to form sulphide (or sulphuret) of potassium, and the nitrogen is liberated; the reaction being shown in the equation $2\text{KNO}_3 + \text{S} + 3\text{C} = 3\text{CO}_2 + 2\text{N} + \text{K}_2\text{S}$. Powder consisting of one equivalent each of nitre and sulphur, and three equivalents of carbon, would contain 74.8 per cent. of nitre, 11.9 per cent. of sulphur, and 13.3 per cent. of carbon or charcoal, which approximates very closely to the Austrian powder in the above table. It is easily shown that one volume of such powder would yield 296 volumes of mixed carbonic acid and nitrogen gases, after the ordinary reduction for temperature and pressure, though from the intense heat developed at the moment of explosion the actual dilatation amounts to at least 1,500 times the volume of the powder employed. The only solid residue, supposing the above equation to represent the true reaction is sulphide of potassium (K_2S), and part of this is volatilized by the heat of the explosion, causing a whitish smoke by its combustion, while the part that is not burned gives the peculiar odor to the washings of the gun-barrel. If a larger proportion of charcoal is added, more or less carbonic oxide gas is generated as a product of combustion. Blasting powder is so composed that, theoretically, it should yield on explosion a mixture of carbonic oxide and carbonic acid gases, and leave a residue of acid sulphide of potassium; the reaction being expressed by the equation $2\text{KNO}_3 + 2\text{S} + 4\text{C} = 2\text{CO} + 2\text{CO}_2 + 2\text{N} + 2\text{KS}$. A powder composed according to this formula would contain 64.4 per cent. of nitre, 20.4 per cent. of sulphur, and 15.2 per cent. of carbon; and the proportions actually employed are 65, 20, and 15, respectively. Recent investigations of Bunsen and Schischkoff (Poggendorff's *Annalen*, Bd. 102, p. 321) show that in reality the chemical reactions are very far from being as simple as those given in the preceding paragraphs; the solid residue consisting of various compounds of potassium (sulphate of potash being in greatest quantity), with portions of nitre and carbon.

The ignition of G. must be distinguished from its combustion. The powder is ignited when a portion of it begins to develop light and heat; this in granulated G. communicates from grain to grain with the utmost rapidity; but it is important to bear in mind, by successive ignitions. Combustion means the final and total decomposition of each grain separately, and the complete liberation of its component gases. In G. these phenomena follow each other so rapidly, that, unless the mass is spread over a considerable space, they *appear* simultaneous. The heat spread around by each grain during its combustion suffices to ignite all other grains within a sphere of six times its own diameter. This serves to account for the almost instantaneous communication of the flame throughout the whole quantity exposed. The granulation of G. has great influence on the rapidity of its ignition; the larger the grain, the more rapid the ignition, but the slower the combustion. On the other hand, small-grained powder ignites more slowly, and burns with greater speed. When mealed

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or finely powdered G. is employed, it readily inflames, from the presence of the ordinary ingredients; but there being no interstices, the conflagration spreads but slowly, and therefore the decomposition is proportionately retarded. It thus happens that mealed powder exhibits less explosive power and less rapidity of combustion the closer it is pressed together, a fact taken into account in the manufacture of fire-works.

In rifled guns and muskets, where it is desired that the projectile should expand to the shape of the grooves, it is obviously best to have a powder which, by very rapid ignition, creates the utmost sudden expansion, and which, by continued combustion, maintains an increasing degree of heat, which shall further augment the explosive force of the gases evolved up to the period of time at which the projectile is driven from the muzzle of the weapon. With this object, large-grained powder is clearly the most suitable, though a contrary view has been long accepted; and that to so great an extent, that some among the recent inventors of rifled arms have had to complain that the only G. that they could obtain has been far *too good* for their purposes.

Process of Manufacture.—The three ingredients being taken to separate mills, are reduced by successive grindings to impalpable powder. The several materials are then taken to the *mixing house*, where they are weighed out into their respective proportions. The charcoal is spread in a trough, and the sulphur and nitre being sifted upon it, the whole are incorporated, though imperfectly, by the hands. The next process is in the *powder-mill*, where the mixture is ground between millstones, and thoroughly incorporated in a wet state. So dangerous is this part of the manufacture, that makers are forbidden to grind more than a limited number of pounds in the same house at one time: all the bearings of the machinery are of copper, lest heat should be generated by the friction. According to the quality intended is the time during which this trituration is continued, from one hour to six being that usually employed and three hours the period in the government factory. The powder, completely pulverized and caked by the moisture and the pressure, leaves the mill in small lumps, called *mill-cake*. This mill-cake is then spread between copper-plates in layers about 3 inches thick, and is subjected to an immense pressure either by a screw-capstan or by a hydraulic engine. The next operation is graining, a process to which, as already explained, G. owes its rapidity of ignition, and its consequent explosive power. This is performed by forcing the mill-cake through minute holes in a circular parchment sieve, the sieve being kept by mechanism in rapid revolution. The grains thus formed are, however, of very various sizes; and that the gunpowder should be homogeneous, it is necessary that they should be sorted into the several sizes. This is done by the intervention of a series of sieves of different degrees of fineness. Since the introduction of the immense modern cannon, it has been found necessary to make powder

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with very large grain, even larger than hazel nuts. This is called *pebble powder*, and is now in general use.

The last processes are drying, glazing, and freeing from dust. The first is effected by heating the powder to a point sufficient to drive off moisture; the second, by the friction of the grains together in a revolving cylinder: the third, by the centrifugal action caused by the powder being twisted round at great speed in a gauze cylinder, when the dust (formed in the polishing) flies off through the gauze, and the bright grains remain as finished gunpowder.

This is the modern system—a system involving considerable personal risk at every stage; for the fine dust becomes so diffused through the atmosphere in the mills, that the slightest spark would blow the whole into the air in a moment. The early process of manufacture was even more dangerous. What with the stirring, and pounding, and spirit (which our forefathers used instead of water, in the idea that a strong fluid would impart strength to the mixture), it was probably to the impurity alone of the materials that the operators were indebted for not being blown to pieces.

The following are the chief properties of G. Good powder should be perfectly uniform in texture, and should not present any light specks or glittering points. The grains should be sufficiently hard not to be easily crushed by the fingers, or to soil them, or a piece of paper, by mere contact. If inflamed on white paper, it should blacken it but slightly, should on no account set fire to it, and should leave only a very slight residue. The temperature at which it explodes has been carefully studied by Violette, who obtained the following results:

	Angular Grains. Pulverized.	
1. Blasting powder explodes at.....	518°	509°
2. War powder explodes at	538°·5	510°·5
3. Sporting powder, fine, explodes at	536°	514°
4. Do. extra fine, explodes at..	603°	518°

The most combustile of these powders was the one containing the largest amount of sulphur, which is the ingredient most ready to enter into ignition. When G. is exposed to a heat of 500°, the whole of its moisture is expelled, and the nitre and sulphur are reduced to the fluid form. On cooling, such powder is intensely black, and the grain has become indurated, and is no longer able to imbibe moisture. Powder is inflamed by any burning substance, by red-hot metal, by the electric spark, or by the violent concussion even of comparatively soft bodies, if it be sufficiently powerful. For example, powder placed upon lead, or even on wood, may be ignited by the shock of a leaden bullet fired at it. Its specific gravity is about 1·8.

The nature of the residue after the ignition of the powder is explained above. Fouling by this residue is avoided by lubricating the barrel with fatty matter. See GUN-COTTON: NITRO-GLYCERINE: EXPLOSIVES.

GUNPOWDER, LAWS RELATING TO: regulations as to the manufacture, conveyance, storage, and sale of this and

GUNPOWDER FACTORY—GUNPOWDER PLOT.

similar explosives. These regulations are stringent, but vary in different states. In general, the manufacture must be in a place remote from human habitation or resort, and with specified precautions. The sale is allowed only under license; and only a limited quantity may be kept in stock. Transportation is under like restrictions. One who violates these laws and causes death thereby, is held guilty of manslaughter in the second degree.

GUNPOWDER FACTORY, ROYAL: establishment at Waltham Abbey, England, where much of the gunpowder required for the British army and navy is made. It is built with every appliance to insure safety, economy, and efficiency; but even here accidents occasionally happen, and roofs and sides, purposely left loose to offer but little resistance, are scattered in the air. Between the different mills mud-banks are raised, and groves of trees thickly planted, to lessen the concussion, and, as far as possible, limit the catastrophe in case of the explosion of one house. A series of raised canals, at the same time, is ready to flood the whole place, or to afford a precarious shelter to the men employed, if time be available. There are about 200 workmen.

GUNPOWDER PLOT, THE: fanatical project of a few Roman Catholics in England to destroy the King, Lords, and Commons on the meeting of parliament 1605, Nov. 5. James I. had succeeded Elizabeth two years before, and his government had exercised great severities against the Rom. Catholics, not merely denying them religious toleration, but confiscating their property. A few ruined and exasperated men banded together to overthrow the government. The originator of the plot was Robert Catesby, who had impaired an inherited fortune by youthful extravagance, and who communicated his idea to Thomas Winter, who was horrified at first, but after a time began to approve and further it. For this end he enlisted into the conspiracy Guy Fawkes, a soldier of fortune, of considerable military experience, and most determined and fearless character. Catesby enlisted two others, by name Wright and Percy—the latter a relation of the Earl of Northumberland. They hired a house and garden contiguous to the parliament-house, and commenced their mine, part working when the others slept, and the rubbish being buried during night. One day they were alarmed by a noise after they had with much labor pierced the wall three yards thick. Fawkes learned that this noise proceeded from a cellar under the House of Lords, which would soon be vacant. He hired it, and barrels of gunpowder were placed in it, and stones and billets of wood placed over them, for the double purpose of concealment and to act as destructive missiles when the gunpowder was fired. In the interval, a brother of Wright and a brother of Winter had been added to the conspirators, so they were now seven. But they wanted money; and to supply it, two others were induced to enter this fanatical copartnery, and these were Sir Everard Digby of Gatehurst, in Buckinghamshire, a

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young gentleman of large estates; and Francis Tresham, a follower of Essex, like Catesby and Percy, but, unlike them, a selfish unenthusiastic man—not a man at all suitable for conspiracy, except that he had two thousand pounds to contribute. Their plan was finally arranged for the re-assembling of parliament, which was to take place Nov. 5. Guy Fawkes was to fire the mine (if the gunpowder in the cellar may be so called), and then flee to Flanders by a ship provided with Tresham's money, and waiting ready on the Thames. All the Roman Catholic peers and others whom it was expedient to preserve, were to be prevented from going to the parliament-house by some pretended message or other, on the morning of the day. After all was ready, Lord Mounteagle was at supper at his country-house at Hoxton, where he very seldom was. As he sat, a page handed him a letter received from a stranger, advising him 'to devise some excuse to shift off your attendance at this parliament, for God and man hath concurred to punish the wickedness of this time.' That this letter was written by or for Tresham, who was Lord Mounteagle's brother-in-law, there can be little doubt. That he desired to save him was certainly one reason for writing it; that he desired to save the conspirators, or at least to allow them to escape, is very probable; and that they might have escaped, but for the fanatical hopes of Catesby, is all but certain. It is also probable that Lord Mounteagle had been fully informed of the whole matter by Tresham and that the supper in the country and the letter were mere devices to conceal Tresham's treachery. When the letter was formally communicated to the king, he at once declared its meaning, and the most simple way of accounting for his power of divination is to suppose that, like Lord Mounteagle, he had been told beforehand. On the very evening of the 4th, the lord chamberlain and Lord Mounteagle visited the parliament-house, and entering the cellar in a casual way told Guy Fawkes, whom they found there, and who passed as Percy's servant, that his master had laid in plenty of fuel. Only fanaticism gone the length of fatuity could have made him persevere after this. But he did, though escape was still possible; and on the morning of the 5th, a little after midnight, he was arrested coming out of the cellar, dressed as for a journey. Three matches were found on him, a dark-lantern burning in a corner within, and a hogshead and thirty-six barrels of gunpowder. He was examined and tortured. He confessed his own guilt, but would not discover his associates. However, he and the chief of them were either killed on being captured, or died on the scaffold; except Tresham, who at first walked about openly, but at last was apprehended, and died of a natural disease in the Tower. The memory of this plot, invested by much fiction, has survived in England; and it was not more diabolical than hopeless and mad. It was in itself mysterious, and for purposes of state policy and Protestant zeal, a further mystery was thrown over it. No name in English history has been more detested than that of Guy Fawkes (q.v.).

GUNROOM—GUNSHOT WOUNDS.

GUNROOM, in Line-of-battle Ships: the common cabin of officers below the rank of lieutenant (with the exception of the assistant surgeon, who sits in the wardroom). In frigates and smaller vessels, the gunroom is the common cabin of the lieutenants, master, surgeon, assistant-surgeon, paymaster, marine officers, chaplain, and chief engineer; the junior officers being in those cases consigned to the cockpit.

GÜNS, *güns* (Magyar. *Köszeg*): small town of Hungary, on a river of the same name, about 57 m. s.s.e. of Vienna. It is inhabited almost wholly by Germans, descendants of Bavaro-Frankish colonists that settled here in the 9th c., who speak a dialect differing from any other German dialect. Fruit and wine are largely cultivated. G. made itself for ever famous by its noble defense for 28 days against the Turkish army under Solymán, 1542. This defense not only forced the Turks to retire, but afforded time for Emperor Charles V. to assemble a force strong enough to oppose them. Pop. (1880) 7,301.

GUNSHOT WOUNDS: wounds produced by projectiles from a gun; varying in severity from a simple bruise to the tearing away of a whole limb. Single balls produce a cut, bruised or lacerated wound, according to the amount of their velocity when they strike the body. The effects of small-shot vary with the distance and power of the gun; when close, the charge enters with the pellets so close together as to make one wound like a single ball. Some years ago, it was commonly believed that the 'wind of a large shot' could produce serious injuries; this belief may have arisen from the circumstance that when a heavy ball, which has lost some of its force, strikes the body at a particular angle, the skin does not always give way, but the deeper structures, such as the muscles, or large organs, as the liver, may be completely crushed. If the wind of a shot could kill a man, it is not likely that soldiers should have had ears, noses, and lips shot off, and yet have experienced only the symptoms produced by those slight injuries.

When a bullet passes out of the body, there are two openings—of 'entrance' and of 'exit'; and the first is generally depressed, round, regular, and smaller than the last. The modern conical ball makes a well-defined oblong wound, but it may shift its direction, so as to strike longitudinally, and cause a more extensive injury to the skin. When a bullet strikes the shaft of a bone, it cracks or splinters it, and either remains or passes through the cancellated ends. In its course, the ball may carry before it pieces of cloth, coins, or other foreign bodies, which increase the danger of the wound. Many persons who have been shot during the excitement of battle, describe the sensation as resembling the sharp stroke of a cane; but in most instances the wounded man soon begins to tremble, as if in an ague fit, complains of cold, his face becomes pale, his pulse scarcely perceptible, and he appears as if about to die. This is the condition termed *shock*; and though

GUNTER—GUNTER'S CHAIN.

death sometimes does ensue during this state of prostration, it is not so serious as it appears, and the patient will probably pass out of it in a few hours with the help of stimulants and rest. Although excessive bleeding is not so common after gunshot as other kinds of wounds, it may occur immediately to a fatal extent, if assistance be not afforded. This assistance any one can give: it consists simply in placing the fingers in the wound, and if the vessel can be reached, pressing them upon it, directed to the proper point by the warm gush of blood. Should the wound be too small to admit the finger, a handkerchief may be tied round the limb above the wound, and twisted tightly with a stick. It is well to examine the wound, to ascertain the extent of the injury, and whether there are splinters of bone or portions of dress lying in it, which should be removed. But neither the examination nor the removal should be attempted if they seem likely to aggravate the injury. The treatment is similar to that of other wounds, and consists in protecting the part during the healing stages, moderating inflammation by cold-water dressings or soothing poultices, and hastening the last stages of cure by stimulating lotions.

GUNTER, *gŭn'tēr*, EDMUND: English mathematician: b. in Hertfordshire, in the end of 1580 or the beginning of 1581; d. 1626, Dec. 10. He was educated at Westminster School, and afterward at Christchurch College, Oxford. While at Oxford, he gave his attention principally to the study of mathematics, and in 1606 invented the sector, with the lines known as Gunter's Scale (q.v.). Subsequently, he took orders, became a preacher, and took the degree of B.D. But the bent of his mind being strongly toward mathematical studies, he obtained the professorship of astronomy in Gresham College, 1619, Mar. 6. His principal works are *Canon Triangulorum* (Lond. 1620), a table of logarithmic sines, etc., to seven places of decimals, being the first table published in accordance with Briggs's system; in this work, we find for the first time the words 'cosine,' 'cotangent,' etc.: *Of the Sector, Cross-staff, and other Instruments* (1624). We owe to G. the invention of the surveying-chain (see GUNTER'S CHAIN), and the first observation of the variation of the compass.

GUNTER'S CHAIN, *gŭn'terz chān*: surveyor's measure, named after the inventor (see GUNTER, EDMUND), consisting of a series of iron links, usually 100, each being 7.92 inches in length, or 66 ft. in total length; its convenience in practice turns on the fact that 10 square chains make one acre. GUNTER'S SCALE, *-skāl*, or GUNTER'S LINES, name given to three lines seen on almost any sector, and marked N, S, T, meaning the lines of logarithmic *numbers*, of logarithmic *sines*, and of logarithmic *tangents*. To understand their construction and use requires a knowledge of logarithms; they are explained in every school-book of practical mathematics. The distances of the divisions marked 1, 2, 3, etc. on the line of logarithmic numbers, represent the logarithms of those numbers—viz., 0, .301,

GUNTUR—GURGINA BALSAM.

477, etc.—taken from a scale of equal parts. The other lines are constructed on an analogous plan. Calling to mind that multiplication of numbers is effected by the addition of the logarithms, division by their subtraction, involution by their multiplication, and evolution by their division, we are able to perceive with what ease many *rough* problems in areas, height, cubic contents, and other matters may be performed by means of this scale.

GUNTUR, or **GUNTOOR**, *gūn-tōr'*: town in the presidency of Madras, about 18 m. s. of the Kistna or Krishna, and about 30 w. of the Bay of Bengal; lat. 16° 20' n., and long. 80° 30' e. Though badly built and much overcrowded, it is yet understood to be healthful. The district of G. is now merged into the collectorate of Kistna or Krishna. Pop. of town abt. 20,000.

GUP, n. *gūp* [Anglo-Indian slang]: tattle; current rumors in bazaars; topics of the time and place.

GURDÁSPUR, *gōr-dās-pōr'*: dist. of British India, in the lieut. governorship of the Punjab; lat. 32° 30'—31° 36' n., long. 74° 56'—75° 45' e.; bounded n. by the states of Kashmir and Chamba, e. by Kangra dist. and Bias river, s.w. by Amritsar dist., w. by Sialkat; 1,822 sq. m.; cap. Gurdáspur. With few and small exceptions the soil is excellent, and produces large crops—the largest in the Punjab without artificial irrigation—of wheat, barley, grain, rice, pulse, cotton, and sugar-cane. In 1875-6, there were 855,675 acres under cultivation. The exports are chiefly agricultural products; imports, English piece-goods, salt, and fancy articles. The villages in the plain and the whole hill portion of the dist. were ceded by the Sikhs to the E. India company after the war 1846, and incorporated with the British Indian empire 1861-2. Pop. nearly 1,000,000. The town Gurdaspur is the capital, but has a pop. of only 4,700.

GURGAON, or **GOORGAON**, *gōr-gā'ōn*: dist. of the Punjab, in the division of Delhi; area 1,938 sq. m. The people are mostly agricultural; the Hindus being twice as numerous as the Mussulmans. Pop. about 690,000.

The chief town Gurgaon (pop. 4,000) is 21 m. s. of Delhi, on the Rajputana state railway, and 817 ft above the sea. Its temperature ranges between 66° and 104° F.

GURGE, n. *gérj* [L. *gurgēs*, a whirlpool]: in *OE.*, a whirlpool; a gulf: *V.* to swallow up. **GURGING**, imp. **GURGED**, pp. *gérjd*.

GURGEONS, n. plu. *gér'jūnz* [F. *gruger*, to granulate, to crumble: Dut. *gruizen*, to reduce to small bits]: that part which remains after the fine meal has passed the sieve; the siftings of meal: see under **WHEAT**.

GURGES, *gérj'ěz*, or **GORGES**, *gaw'jěz*: a charge in heraldry, meant to represent a whirlpool: it takes up the whole field, and when borne proper, is azure and argent.

GURGINA BALSAM, *gér-jī na bawl'sam*,



Gurges.

GURGLE—GURNARD.

or **WOOD OIL**: balsamic liquid, obtained from the Gurjun tree (*Dipterocarpus turbinatus*): see DIPTERACEÆ: **WOOD OIL**.

GURGLE, *v.* *gér'gl* [L. *gurgēs*, a whirlpool; *gurgŭliō*, the windpipe, the gullet: an imitative word]: to flow with an irregular bubbling noise, as water in a small pebbly stream, or from a bottle. **GURGLING**, *imp.* *gér'glīng*: **ADJ.** running or flowing with a broken bubbling noise: **N.** a gushing or flowing with a broken, bubbling, or clucking noise. **GURGLED**, *pp.* *gér'gld*.

GURGOYLE: see **GAR GOYLE**.

GURHWAL, *gér-wál* (*Garhwál*): native state in the N. W. Provinces of India, on the borders of Tibet: 9,180 sq. m. Pop. (1881) 199,836; (1901) 268,885.

GURHWAL (*Garhwál*): British dist. in N. W. Provinces, next to independent G.: 5,500 sq. m. Pop. 350,000. Being on the s. slope of the Himalaya, G. is little more than a mass of stupendous mountains, some of whose elevations reach 23,000 ft.. It may be regarded as the cradle of both the Jumna and the Ganges, attracting, in spite of the length and ruggedness of the way, crowds of pilgrims to the peculiarly sacred localities of Jumnotri, Devaprayaga, and Gangotri.

GURKFELD, *gúrk'fēlt*: town of Carniola, Austrian Empire, on the right bank of the Save, 46 m. e. by s. from Laibach, at the base of a mountain range. It is supposed to occupy the site of the Roman Noviodunum. The district produces much wine. There are thermal springs and baths in the town. It contains a Capuchin monastery. Pop. about 6,000.

GURMUKTESWAR, *gér-mók-tēs'wār*: town of British India, district of Meerut, on the route from the town of Meerut to Moradabad, 31 m. s.e. of the former. It is on the right bank of the Ganges, about 4 m. below the reunion of the Burha Ganga, or old course of the Ganges, with the present main channel, which, a mile and a half above the town, is crossed by a much-frequented ferry, on which 15 boats constantly ply. G. may be regarded as the port of Meerut and the adjoining district of the Doab. Pop. 8,000.

GURNARD, *n.* *gér'něrd*; sometimes **GURNET** [OF. *gournauld*—from *grogner*, to grumble: F. *grognard*, grunting], (*Trigla*): genus of acanthopterous marine fishes of the family *Sclerogenidae*, containing a considerable number of species. The head in the gurnards is angular, and wholly covered with bony plates; the body is elongated, nearly round, and tapering; there are two dorsal fins; the pectoral fins are large; the teeth are small and numerous. Many are notable by beauty of color. They are supposed to have received the name G. from the sound which they sometimes emit, particularly when newly taken out of the water, and which has obtained for one or two species the local name of *Piper*. A recent observer, M. Dufossé, ascribes the sound to the vibration of muscles connected with the air-bladder, and has assigned to the notes produced by

GURNEY—GUROWSKI.

different species their particular places in the musical scale. Most of the gurnards live generally near the bottom, and are caught either by the trawl-net or by hook and line, a shining piece of sand-eel being a very captivating bait. Although not among the finest of fishes, they are good for the table. The RED G. (*T. cuculus* or *T. pini*) is seldom more than 15 or 16 inches long; of rose-red color, the



Gurnard (*Trigla pini*).

body marked on the upper part with fine transverse lateral ridges. A larger and more valuable species, sometimes two ft. long, is the SAPPHIRINE G. (*T. Hirundo*), remarkable for the large size of its pectorals and the blue of their inner surface. The GRAY G. (*T. gurnardus*) is a common species, generally of a gray color, more or less clouded or spotted with brown, black, and yellowish-white. There are numerous species in the Mediterranean.

GURNEY, ELIZABETH: see FRY, ELIZABETH.

GURNEY, *ger'nĭ*, JOSEPH JOHN: 1788, Aug. 2—1847, Jan. 4; b. Earlham Hall, near Norwich, England: philanthropist. He was educated privately at Oxford, and 1818 became a minister of the Society of Friends. His life was devoted to benevolent enterprises. G. wrote among many works—*Notes on Prison Discipline* (Lond. 1819); *Observations on the Religious Peculiarities of the Society of Friends* (1824); *A Winter in the West Indies described in Familiar Letters to Henry Clay of Kentucky* (1840).

GUROWSKI, *gô-rôv'skĕ*, ADAM, Count DE: 1805, Sep. 10--1866, May 4; b. Kalisz, Poland: author. He was expelled from the Warsaw gymnasium for his revolutionary sympathies, studied 5 years in German universities, returned to Warsaw and was several times imprisoned, was a leader in the organization and conduct of the revolution 1830, lost his estates, was condemned to death, and escaped to Paris on the suppression of the revolt, was recalled to Russia and employed in the civil service 1835, resumed study in Heidelberg Univ. 1844, and came to the United States 1849. He spent several years in lecturing and teaching languages, of 8 of which he was master, and was translator in the state dept. Washington 1861-63. His publications include *La Vérité sur la Russie* (1835); *La Civilisation et la Russie* (1840); *Pensées sur l'avenir des Polonais* (1841); *Impressions et Souvenirs* (1846); *Le Panславisme* (1848); *Russie*

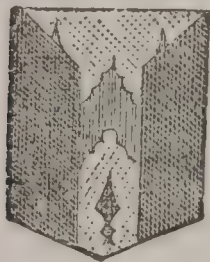
GURRY—GUSTAVIA.

as it Is (1854); *The Turkish Question* (1854); *A year of the War* (1855); *America and Europe* (1857); *Slavery in History* (1860); and *My Diary*, civil war notes, 3 vols. (1862-66).

GURRY, n. *gŭr'rĭ*: a small fort in India.

GURT, n. *gert* [a corruption of **GUTTER**, which see]: in *mining*, a gutter or channel for water, usually hewn out of the pavement or bottom of a working drift.

GUSSET, n. *gŭssĕt* [F. *gousset*, a fob, the arm-pit—from F. *gousse*; It. *guscio*, the pod or husk as of peas]: in *armor*, a piece at first of chain, and afterwards of plate armor, intended as a protection to the vulnerable point where the defenses of the arm and breast left a gap; triangular piece of cloth put into a garment to enlarge or strengthen a part: in *mech.*, an angular piece of iron to unite parts, or to give strength and stiffness to the angular parts of a structure: in *heraldry*, one of the abatements or marks of disgrace for unknighly conduct. It is represented by a straight line extending diagonally from the dexter or sinister



Gusset.

chief point one-third across the shield, and then descending perpendicularly to the base. Herald's tell us that a G. dexter indicated adultery; a G. sinister, drunkenness. Cowardice was indicated by the gore sinister (see **GORE**), which, though somewhat similar, we are told carefully to distinguish from the gusset. According to Guillim, gores and gussets 'are things

in use among women, especially semsters, and therefore are fit notes of cowards and womanish dispositions.'

GUSH, n. *gŭsh* [Ger. *giessen*; Dut. *gosselen*, to pour: Icel. *gusa*, to spirt out, to gush: Gael. *gais*, a torrent: Swiss, *gusseln*, to dabble in wet]: a sudden and violent flowing out of a liquid from an inclosed place; a sudden flow: V. to rush as a fluid from confinement; to issue with force and rapidity. **GUSH'ING**, imp.: **ADJ.** breaking forth with a gush or rush: exuberant; demonstrative: N. a rushing forth with impulsive force. **GUSHED**, pp. *gŭsh't*. **GUSH'INGLY**, ad. *-lĭ*.

GUST, n. *gŭst* [Icel. *gustr*, a cold blast of wind: Gael. *gaoth*, the wind]: a sudden blast of wind; a sudden violent burst of passion. **GUSTY**, a. *gŭs'tĭ*, subject to gusts; stormy; hasty or fitful in temper.

GUST, n. *gust* [L. *gustus*, taste, flavor: It. *gusto*: F. *goût*]: sense of tasting; relish; intellectual taste: V. in *OE*, to taste; to have a relish of. **GUST'ABLE**, a. *-tĭ-bl*, pleasant to the taste. **GUST'ATORY**, a. *-tĭ-rĭ*, pertaining to the taste; tending to please the taste. **GUST'O**, n. *-t* [It.]: relish; that which excites pleasant sensations in the palate and tongue. **GUST'FUL**, a. tasteful. **GUST'FULNESS**, n. tastefulness; the relish of a thing.

GUSTATORY, **GUSTO**: see under **GUST** 2.

GUSTAVIA, *gŭs-tŭv'-ă*: chief town of the French (till 1878, Swedish) island of St Bartholomew in the W. Indies. It is on the s.w. coast, and has a good harbor. Pop. about 1,000.

GUSTAVUS I.

GUSTAVUS, *gŭs-tŭ'vŭs*, I. (known in history as GUSTAVUS VASA, but designated before his accession to power, by himself and others, GUSTAVUS ERICSSON), King of Sweden: 1496, May 12—1560 (reigned 1523-60); b. at Lindholm, Sweden. As the descendant of an ancient Swedish family, which had given members to the national diet for nearly 200 years, and which had been distinguished for opposition to Danish supremacy, G. was involved at an early age in the unfortunate domestic wars of that period; and the future king was active in the defense against Christian II. of Denmark, who, 15 7, in person commanded an assault on Stockholm, with the object of compelling the Swedish administrator, Svante Sture, and his senate to acknowledge him as king of Sweden. When famine compelled Christian to relinquish the siege, he had recourse to fraud; and having enticed a deputation from the senate, among whom was G., on board his ship, he set sail, and treacherously carried his captives to Denmark, where G. spent a year in confinement in the custody of his maternal relative, Erich Baner, Lord of Kalloe, in Jutland. While under confinement, G. heard such alarming rumors of the expedition which the king was preparing against Sweden, that, irritated beyond endurance, he broke his parole, and escaped in the disguise of a pilgrim, or according to others, as a drover, and after encountering numerous dangers, reached Lubeck (1519, Sep.), whence he was with difficulty conveyed to Sweden, where he landed 1520, May, near Calmar, the only place of note, except Stockholm, that still held out against the Danes. G. made his way into the castle of Calmar, which was defended by foreign mercenaries; but as his admonitions to the garrison to show more zeal in their defense were met by threats of delivering him to the Danes, he left Calmar and took refuge among his father's peasantry in Smaaland. The Smaalanders had, however, already taken the oaths of allegiance to the envoys who had been sent through the country by Christian II. to ascertain the sentiments of the people, and G. was soon compelled to retreat to Dalecarlia, where he wandered for several months, in poverty and disguise, with a price set on his head, and finally made his way, penniless and almost naked, to the house of his brother-in-law, Joachim Brahe, just as the latter was preparing to obey the summons of Christian II. to attend his coronation. Having failed to dissuade Brahe from attending this ceremony, 1520, Nov., G. retired to his father's property of Rŭfsnŭs, where he remained till he heard of the massacre known as the Blood-bath, in which, three days after the coronation, on the plea of their being the enemies of the true church, the greater number of the nobles and leaders of Sweden, including Brahe himself and G.'s father, Eric Johansson, were slaughtered in cold blood. G. then retreated to the less frequented parts of Dalecarlia, where for a time he earned his living as a field-laborer, and more than once owed his life and safety to the generosity of the peasant-women of the district. This period of his life has been so long the subject of traditionary lore and romance, that it is difficult

GUSTAVUS I.

now to separate the true from the false; but the fame of his supposed adventures still lives in the minds of the people of Sweden, who cherish as sacred every spot associated with his wanderings and dangers. His appeals to the Dalecarlians met no success, until his account of the tyranny of the Danes was corroborated by the testimony of several fugitives from Stockholm, when a reaction followed, the national enthusiasm was roused, and the men of Dalecarlia, having called together a diet at Mora, proclaimed him head of their own and other communes of Sweden.

This was the turning-point in his life, for the peasantry now flocked around him from every side: and before another year had passed many of the strongest posts of the enemy had fallen into his hands, and he was able to enter upon the siege of Stockholm, which terminated 1523, when Christian II. was compelled by his enraged subjects to resign the crown and retire from Denmark. His forcible abdication brought the Scandinavian union to a sudden close, after it had existed for 126 years; for when Frederick I., successor of Christian, demanded his recognition in Sweden, conformably to the Union of Calmar, the Swedes declared at the diet of Strengnaes that they would have no other king but Gustavus Ericsson. But although G. was at once recognized as king, he was not crowned till two years later, in consequence of his unwillingness to receive the crown from the hands of the Roman Cath. bishops. The king early showed his determination to favor the Lutheran doctrines, and to cripple the power of the Roman clergy, on whom he laid a large proportion of the heavy imposts to meet the expenses of the war; and though his opinions were for a long time not favorably received by the people, he finally succeeded in establishing the Reformation in Sweden.

The disaffection of the peasantry, who threatened to destroy the nobility, and the imprudence of the Lutheran clergy, who tried to force the people to adopt the reformed doctrines, combined to thwart many of G.'s schemes for the improvement of the country; and his latter years were embittered by the jealousy and dissensions of his sons, Eric and John. Yet G. effected more than any other Swedish monarch for the welfare of the people. He had found Sweden a wilderness, devoid of cultivation, and a prey to the turbulence of the people and the rapacity of the nobles; and after 40 years' rule, he left it a peaceful and civilized realm, with a full exchequer, and with a well-organized army of 15,000 men and a good fleet, which both were his creations. He promoted trade at home and abroad. Every profession and trade received his attention and fostering care, and schools and colleges owed to him their revival, after the decay of the older Rom. Cath. institutions. He made commercial treaties with foreign nations, and established fairs for foreign traders. In his reign, roads and bridges were made in every part of the country, and canals begun, one of which has only recently been brought to completion. In his relations with his subjects, G. was firm, sometimes severe, but seldom unjust, except in his dealings toward the Roman clergy, whom he despoiled with something

GUSTAVUS II.

like rapacity of all their lands and funds. He promoted Lutheranism, but took care that the reformed clergy should be dependent on the crown, and receive only very moderate emoluments. To him the various tribes of Lapps were indebted for the diffusion of Christianity among them by Lutheran missionaries; while the Finns owed to him the first works of instruction, Bibles and hymn-books printed in their own language. G. was methodical, just, moral, and abstemious in his mode of life; an able administrator; and, with the exception of a tendency to avarice, his qualities were worthy of esteem. His religious intolerance was in large part the spirit of his age. He was three times married, and had ten children. The name Vasa, which has been supposed an ancient patronymic in his family, but erroneously, since surnames were not in use among the Swedish nobility until a later date, was adopted by him subsequently to his accession, and is conjectured by the historian Gejer (q.v.) and others to have been derived from his heraldic arms, which bore originally a black fascine used in storming, and afterward drawn like a vase, but changed by G. to yellow, whence it came to be mistaken for a sheaf. By an act of the diet of 1544, at Westeraas, the crown was declared hereditary in the male descendants of G.; in conformity with which his eldest son Eric (q.v.) succeeded to the throne.

GUSTA'VUS II., or GUSTA'VUS ADOL'PHUS, King of Sweden: 1594, Dec. 9—1632, Nov. 6 (reigned 1611–32); b. Stockholm: grandson of Gustavus Vasa, by that king's youngest son, Charles IX., at whose death, G. succeeded to the throne. G. had been strictly brought up in the Lutheran faith, and carefully trained in habits of business, and was one of the most accomplished princes of his age. He was acquainted with eight languages, five of which he spoke and wrote fluently, was well read in the classics and ancient history, a proficient in music, and excelled in all warlike and manly exercises. At his accession to power, he found the country involved in wars abroad, and disorders at home, arising from the disputed succession of his father who had been elected king on the exclusion of his nephew, Sigismund, King of Poland, the direct heir, whose profession of the Rom. Cath. religion made him obnoxious to the Swedish people, and virtually annulled his claims to the crown. The first act of G. was to secure the hearty co-operation of the nobles, whose privileges he confirmed and made dependent on the performance of military service to the crown, and thus laid the foundation of an essentially feudal or military form of government, in which the nobles held their lands directly, and the peasantry indirectly, under the crown. In addition to these two bodies, which had formerly constituted the national diet, G. for the first time admitted special delegates of the army into the assembly as assessors to the nobles. Having thus organized the internal government, and succeeded in levying heavy imposts and raising some companies of efficient troops, he inaugurated his military career by a war with Denmark, which at that time occupied the Baltic districts of the

GUSTAVUS II.

Swedish territories, and thus completely cut off the Swedes from direct communication with the continent of Eastern Europe. The war continued for a year, and terminated in a peace by which G. renounced his claims on the Lappish districts and other disputed territory, and recovered possession, under certain conditions, of Calmar, Oeland, Elfsborg, and the province of Gottenborg.

Having thus gained an outlet on the Baltic, secured a peacefully in the king of Denmark, and concluded an alliance with the Netherlands, G. turned his attention to the Russian war, which, after fluctuating success, was concluded 1617, by the treaty of Stolbova, by which Sweden obtained supreme dominion over Ingermanland and Karelia, and part of Litland, while Russia recovered Novgorod and all other conquests made by the Swedes. The boundary of the Swedish territory, which then included the site of the future St. Petersburg, was marked, after the peace by a stone which bore the three crowns of Sweden above a Latin inscription, recording that it marked the limits of the dominions of G. A., king of Sweden. The disputes with Poland, however, remained undecided; and in 1621, war was declared between the two countries, and continued, with occasional intermission, till 1629, when it terminated in a six years' truce, which was settled by a treaty that secured reciprocity of trade and freedom of religion to the natives of both countries, and left G. master of Elbing, Braunsberg, Pillau, and Memel.

This peace enabled G. to mature the plans that he had long cherished in regard to Germany; and having made various administrative reforms, and availed himself of the short interval of peace to promote the material prosperity of the country, he remitted the government, and the care of his infant daughter Christina, to his chancellor Oxenstiern, and set sail, in the summer of 1630, with an army of about 15,000 men, to aid the Protestants of Germany in their hard struggle against the Rom. Cath. League, which was backed by the power of the empire.

Everything favored the success of the Swedes, who drove the imperialists from Pomerania, and took Stettin. The childless Duke of Pomerania engaged, in return for Swedish aid, that the dukedom should, after his death, be given up to Sweden, until the expenses of the war were fully repaid; while France, through hatred of the empire, agreed to furnish G. with a subsidy of 400,000 rix-dollars as long as he maintained an army of 36,000 men. Wallenstein had retired from the service of the emperor. But while the Swedes were besieging Spandau and Küstrin, the city of Magdeburg, which had applied to G. for assistance, was taken 1631 by the imperial general, Tilly, whose troops perpetrated the most terrible atrocities against the unfortunate inhabitants. Although G. could not save Magdeburg, he soon after its fall inflicted a defeat on the imperialists at Breitenfeld, which excited the respect and fear of the Rom. Catholics, who thenceforward ceased to despise the 'snow-king and his body-guard,' as they designated G. and his small army. The king now advanced into

GUSTAVUS II.

Franconia, and after allowing his army to recruit their strength in the rich bishoprics of Würzburg and Bamberg; took the Palatinate and Mainz, where he held a splendid court, surrounded by numerous princes and ambassadors. In the spring of 1632, the Swedes, in the face of Tilly's army, crossed the Danube, and gained a decisive victory at Ingolstadt, where Tilly was mortally wounded. Thence the march to Munich was one continued triumph, and wherever G. appeared he was received by the populace as their guardian angel. The road to Vienna was now open to him, and the fate of the emperor would have been sealed, had the emperor not recalled his general, Wallenstein, who, having accepted office on his own terms, gathered a large army, with which he advanced on Nürnberg; but after standing a desperate assault of the Swedes, he was obliged to retire into Thuringia. The unfavorable season and the bad roads hindered G. from attacking the imperialists at the time which he had intended; but 1632, Nov. 6, the two armies came finally face to face at Lützen. As usual, the Swedes began by singing Luther's hymn, *Eine feste Burg ist unser Gott*, and a hymn composed by the king. G. then made an address to the army, and swinging his sword above his head, he gave the word of command, and with the cry of 'Onward!' he rushed forward followed by the eager troops, who were commanded jointly by himself and Bernhard of Saxe-Weimar. Victory was already on the side of the Swedes, when a strong reinforcement of imperialists appeared under the command of Pappenheim. G. seeing that his troops wavered under this fresh attack, rode hastily forward, when, having come too near a squadron of Croats, he received a shot in his arm, and, as he was turning aside, another in the back, which caused him to fall from his horse. The sight of the riderless animal spread dismay and fury among the Swedes; but before they could advance to his rescue, a party of Croats had thrown themselves between the king and his army; and it was not till after many hours' hard fighting, and when the field was strewn with 10,000 dead and wounded, that the Swedes recovered the body of their king, which had been plundered, stripped, and covered with wounds. The artillery of the enemy fell into the hands of the Swedes, who remained masters of the field, after having fought with an impetuosity that nothing could resist. A rumor long prevailed that the shot in the back which caused the king to fall was from the hand of Albert, Duke of Saxe-Lauenburg, but no just ground appears for the suspicion.

Although G. was eminently a warlike king, he made many salutary changes in the internal administration of his country, and devoted his short intervals of peace to the promotion of commerce and manufactures. He was pre eminently religious, and his success in battle is perhaps to be ascribed not only to a better mode of warfare, and the stricter discipline which he enforced, but also still more to the moral influence which his deep seated piety and his personal character inspired among his soldiers. He was one of the greatest and noblest figures in history. In

GUSTAVUS III.

the art of war he was a recognized master. The spot where he fell on the field of Lützen was long marked by the *Schvedenstein*, or Swede's Stone, erected by his servant, Jacob Erichsson, on the night after the battle. Its place has been taken by a noble monument erected to his memory by the German people 1832, on the occasion of the second centenary of the battle.

GUSTA'VUS III., King of Sweden. 1746-1792, Mar. 29 (reigned 1771-92); b. Stockholm; son and successor of Adolphus Frederick. His reign began when the country was distracted by the intrigues of the rival political parties of Horn and Gyllenborg, known as the 'Hats' and 'Caps.' Finding that the people, thoroughly wearied with the misrule of the nobles, were ready for any change, G. covertly fomented the general discontent, and having raised a fictitious rebellion, through the agency of his friend and adherent, Captain Hellichius, he collected a large body of troops, on pretense of restoring order, and having arrested the council in a body, convoked the diet, and laid before it a newly framed constitution, to which the assembly was compelled to subscribe. A revolution was thus effected without the shedding of blood, and by a stroke of the pen G. recovered all the regal powers that had been gradually lost by his immediate predecessors. G. acted with great moderation after this successful *coup d'état*; and he might have long retained the advantages that he had gained, if his love of display, and his wish to emulate the king of France in extravagance and magnificence, had not led him into profuse expenditure, which embarrassed the finances; at the same time, the introduction of the manners and usages of Versailles at his own court irritated the national party, while it undoubtedly tended to demoralize the upper classes, and through them the nation generally. In 1788 he engaged in war with Russia, at the moment that the empire was engaged in active hostilities against the Turks, but derived no advantages from the contest. On the breaking out of the French Revolution, he combined with the other monarchs against France, and applied to the diet for funds to assist the Bourbons. His repeated applications having been decisively rejected, the nobles, among whom he had many enemies, took advantage of his general unpopularity, and entered into a conspiracy against him, the leaders of which were Ribbing, Horn, and Pechlin; and 1792, Mar. 16, G. was mortally wounded by their agent, Capt. Ankarström (q.v.), at a masked ball in the opera-house which he had himself built. The pistol had been loaded with broken shot, which rendered the wound especially painful, and the king suffered dreadful agony for 13 days until his death.

G. was a man of varied learning, and author of several dramatic works and poems of considerable merit. His writings have been published in a collective form in Swedish and French. Certain papers deposited by him 1783 in the library of Upsala—not to be opened for 50 years after his death—were published 1842, but have little interest or value.

GUSTAVUS IV.—GUSTAVUS ADOLPHUS UNION.

GUSTA'VUS IV.: 1778, Nov. 1—1837 (reigned 1792-1809); son and successor of Gustavus III. His uncle, Duke of Sudermania, acted as regent during his minority. The young king, on his accession to power, at once gave evidence of the high estimate at which he held the kingly power, and his first act was to join the third coalition against France, contrary to the wishes of his people. Hatred of Napoleon soon, however, became the guiding influence of his life: G. was under a firm conviction that Napoleon was the Great Beast predicted in the Apocalypse. The result of his decided line of policy led to the occupation of Swedish Pomerania by French troops under Marshal Brune, who took Stralsund and Riga from the Swedes 1807, and thus deprived them of the last of their German possessions. The king opened all his ports to English vessels, and thereby involved himself in a war with Russia. The scene of these hostilities was Finland, which the Swedes were obliged to give up to Russia at the close of 1808. Norway became next the scene of war, the Swedes being assisted by an English subsidy of 10,000 men, who, however, speedily returned to England when they found that G. intended to send them to Finland. The unfortunate war with Russia, which had been excited entirely through the folly of the king, gave rise to so much discontent in Sweden, that a conspiracy was set on foot by several officers and nobles, the object of which was to dethrone the unpopular monarch. The conspirators took forcible possession of the palace at Stockholm, and placed him under arrest; and after an ineffectual attempt at escape, he consented to abdicate the throne, 1809, Mar. 29. After wandering for a time from place to place, under the name Colonel Gustavson, he finally settled at St. Gall, where he died, forgotten and in poverty, 1867. His uncle, the Duke of Sudermania, after acting as regent of the kingdom, was finally proclaimed king, under the title of Charles XIII., at the diet which met 1809, May. By the consent of the diet, Charles XIV. (Bernadotte) paid over the value of the private estates of the family of Vasa for the benefit of Gustavus and his children: but as the dethroned king refused to receive any of this money directly, or to accept the pension which the Swedish government had settled upon him, he was often in pecuniary difficulties, from which he was clandestinely relieved by his divorced queen and children, who contrived, without his knowledge, to supply his wants.

GUSTA'VUS ADOL'PHUS UNION: assoc. conceived by Dr. Grossmann of Leipsic and organized 1832, Nov. 6 at Lützen, at the 200th celebration of the death of the Prot. hero, for the purpose of assisting feeble congregations of evangelical Protestants in any part of the world. The founders deemed such an assoc. a more appropriate memorial to Gustavus Adolphus than any monument. The assoc. was recognized and its purposes and rules were confirmed by the king of Saxony 1834, Oct. 4: and since then with annual receipts of about \$150,000 it has established 43 minor assocs., with 1,160 branches, 8 students', and 371

GÜSTROW—GUTENBERG.

women's assoc., and has built 1,068 churches, 639 school-houses, and 358 parsonages. It is exceedingly popular in Prot. parts of Germany, Sweden, and the Netherlands.

GÜSTROW, *güs'trōv*: town of Mecklenburg-Schwerin, long the residence of the princes; on the left bank of the Nebel, 27 m. s. of Rostock. Among the principal buildings are the gymnasium, the old castle (now the work-house), the fine Gothic cathedral, and the town-house. The former ramparts have been converted into pleasant gardens. *G.* carries on distillation and beer-brewing, has several water-mills. Pop. (1880) 11,997; (1900) 16,882.

GUT, *n. güt* [Icel. *gutla*, to sound as a liquid agitated in a cask: Low Ger. *küt*, guts, bowels: Dut. *kuit*, spawn or roe of fish: Scot. *kyte*, the belly: Swiss, *gudeln*, applied to the rumbling of the bowels]: the intestinal canal reaching with many convolutions from the stomach to the anus; a passage or strait; a substance made from a silk-worm, when ready to spin its cocoon, by pulling out and extending the silk part to a fine thread, and then hanging it up to dry: *V.* to take out the inside of anything; to plunder thoroughly. **GUTTING**, *imp.* **GUTTED**, *pp.* **GUTS**, *n. plu.* stomach; the intestines; receptacle for food; gluttony.

GUT, *n. güt* [Sw. *gjuta*, a mill-lead: Dan. *gyde*, a lane: O.Dut. *gote*, a channel]: in *OE.*, a wide ditch or water-course that empties itself into the sea; a strait or channel; a bay. *Note.*—Skeat makes **GUT** 1 and 2 identical, the former being derived from the latter.

GUTENBERG, *gō'ten-berĥ*, **JOHANNES**, or **HENNE** (proper name, **GENSFLEISCH**, or **GÄNSFLEISCH**): regarded by the Germans as the inventor of the art of employing movable types in printing: abt. 1410–1468, Feb. 2; b. Mainz; of a patrician family, which took the names of Gutenberg and Gensfleisch, from two estates in its possession—the former being the mother's name, the latter the father's. Of *G.*'s early life no particulars are known, but it seems probable that he early applied himself to mechanical arts. In 1434, he was living in Strasburg, and there, 1436, made a contract with Andrew Dryzhen, or Dritzehn, and others, by which he bound himself to instruct them in all his 'secret and wonderful arts,' and to employ these for their common advantage. This undertaking, which comprehended the first steps in the art of printing, was frustrated by the death of Dryzehn, particularly as George Dryzehn, a brother of the deceased, commenced a lawsuit with *G.*, which was decided against the latter. When and where the first attempts in the art of printing were made, has not been ascertained, as the works printed by *G.* bear neither name nor date; this, however, is certain—that movable wooden types were first employed by him about 1438. In 1443, he returned from Strasburg to Mainz, where, in 1449 or 50, he entered into partnership with Johannes Faust, or Fust, a wealthy goldsmith. Faust furnished the money required to set up a printing-press, in which the Latin Bible was printed for the first time. This partnership was dissolved after a few years. Faust had

GUTENBERG.

made large advances, which G. was now to refund, but as he possessed neither the power nor the inclination, the matter was brought before a court of justice. The result was that Faust retained the printing concern, which he carried on and brought to perfection, in conjunction with Peter Schöffer of Gernsheim. By the assistance of Conrad Hummer, a councilor of Mainz, G. was again enabled to set up a press, from which in all probability, proceeded *Hermannus de Salsdis Speculum Sacerdotum*, printed in quarto without date or name. According to some, four editions of the *Donatus* were likewise printed by G., while others ascribe them to Faust and Schöffer. In 1457, appeared the Latin *Psalterium*, or rather a breviary containing psalms, with antiphones, collects, etc., and arranged for choruses for Sundays and holidays. This specimen of the art of printing, remarkable as being the first bearing the name of the printer and the locality, as well as the year and day of its completion, and valued by Dibdin at \$50,000, was printed with an elegance which sufficiently proves the rapid progress that had been made in the newly invented art, and the diligence with which it had been prosecuted. G.'s printing establishment existed till 1460 in Mainz. He died 1468, Feb. 2—the same year in which the abp., Elector of Mainz, appointed him one of his courtiers, and raised him to the rank of a noble, though others place his death at the close of the previous year. The evidence in favor of G.'s being the inventor of printing, is considered by his countrymen conclusive. They adduce the testimony of Ulrich Zell of Hanau, who introduced the art into Cologne (1462), and who declares that 'this noble art was invented for the first time in Germany, at Mainz, upon the Rhine . . . by a citizen of Mainz, named John Gutenberg.' Similarly speaks Wimpfeling, a learned Alsacian (b. Strasburg, 1451, and partly contemporaneous with Gutenberg). 'In the year 1440, under the reign of Frederick III., an almost divine benefit was conferred on mankind by John Gutenberg, who first discovered the art of printing.' So, too Trithemius (1462–1516). 'At this epoch, this memorable art (viz., of printing) was devised and invented by Gutenberg, a citizen of Mainz;' while Johann Schöffer, son of Peter Schöffer (the partner of Faust), in his preface to a German translation of Livy (Mainz 1505), expressly affirms that 'at Mainz originally the admirable art of printing was invented particularly by the ingenious Johann Gutenberg, 1450,' and that it was 'subsequently improved and propagated to posterity by the wealth and labors of Johann Fust and Peter Schöffer.' That G. may have received the first hints of his invention from the Dutch xylography, is not denied: see COSTER. Ulrich Zell himself admits this; but the invention of typography, and beyond all doubt of the printing press, must be ascribed to the German.—Compare Oberlin's *Essai d'Annales de la Vie de Gutenberg* (Strasburg 1801); Née de la Rochelle's *Eloge Historique de J. Gutenberg* (Par. 1811); Gama's *Essai Historique de Gutenberg* (Par. 1857); and Lamartine's *Gutenberg, l'Inventeur de l'Imprimerie* (Par. 1853).

GUTHRIE.

GUTHRIE, *gũth' rĩ* : city, cap. of Oklahoma Terr. (see OKLAHOMA); on the Chicago Kansas City Wichita Oklahoma Fort Worth and Galveston line of the Atchison Topeka and Santa Fé railroad. The day after the opening of the territory, a meeting of settlers was held, and arrangements were made for surveying town lots and appointing a police force; and in less than two weeks there were five banks (one of which commenced business in a tent on the afternoon that settlers were admitted to the territory) and several newspapers. G. became the temporary capital and (1903, Dec.) is still the seat of the territorial govt. In less than 4 months from its settlement, water-works had been constructed, and arrangements had been made for street cars and electric lighting. Two daily, 8 weekly, and 3 monthly periodicals are published, and there are two national and two private banks. Pop. (1890) 2,788; (1900) 10,006.

GUTHRIE, JAMES, LL.D. : 1792, Dec. 5—1869, Mar. 13; b. Nelson co., Ky. He studied law, and practiced at Louisville; served for many years in the state legislature, both in the house and the senate, and was pres. of the convention by which the present constitution of the state was framed. He was sec. of the U. S. treasury 1853–57, and U. S. senator 1865–68, resigning in the latter year on account of ill health. From 1860 till shortly before his death, he was pres. of a railroad. He died at Louisville.

GUTHRIE.

GUTHRIE, *gūth'ri*, THOMAS, D.D.: pulpit orator, philanthropist, and social reformer: 1803, July 12—1873, Feb. 24; b. Brechin, Forfarshire, Scotland, where his father was a merchant and banker. He went through the curriculum of study prescribed by the Church of Scotland to candidates for the ministry at the University of Edinburgh, and gave two additional winters to the study of chemistry, natural history, and anatomy. Meanwhile, he was licensed as a preacher by the presbytery of Brechin 1825. He subsequently spent six months in Paris, studying comparative anatomy, chemistry, and natural philosophy. Returning to Scotland, he for two years conducted, on behalf of his family, the affairs of a bank agency in Brechin. In 1830, he became minister of Arbirlot, in his native county; and 1837 was appointed one of the ministers of Old Greyfriars parish in Edinburgh. Here his eloquence, combined with devoted labors to reclaim the degraded population of one of the worst districts of the city, soon won for him high public estimation. In 1843, G. joined the Free Church, and for a long series of years ministered to a large congregation in Edinburgh. In 1845-6, he performed a great service to the Free Church, in his advocacy throughout the country of its scheme for providing manse or residences for its ministers. G.'s zeal was not confined to denominational channels. He came forward, 1847, as the advocate of Ragged Schools (q.v.); and to him the rapid extension of the system over the kingdom is largely to be ascribed. He earnestly exerted himself also against intemperance and other prevailing vices. G. had great rhetorical talent; and his style was remarkable for abundance and variety of illustrations. Few public speakers have ever blended solemnity and deep pathos so intimately with the humorous, his tendency to which has by some been deemed a fault. He was a warm-hearted philanthropist, in sympathy with all that tended to social improvement. G.'s most important works are—*The Gospel in Ezekiel, a series of Discourses* (A. and C. Black, Edin. 1855); *The Way to Life*, sermons (Edin. 1862); *A Plea for Drunkards and against Drunkenness*, pamphlet (Edin. 1856); *A Plea for Ragged Schools*, pamphlet (Edin. 1847), followed by a second and a third plea, the latter under the title of *Seed-time and Harvest of Ragged Schools* (Edin. 1862); *The City: its Sins and Sorrows* (Edin. 1857). Perhaps his *Pleas* furnish the best published specimens of Dr. G.'s eloquence. His graphic style undoubtedly added to the immediate popular effect of his oratory, but is not commended as a model: it is overladen with richness and rhetorical elaboration to the sacrifice of the beauty of simplicity. For some years before his death he acted as editor of the *Sunday Magazine*, founded 1864, in which year he retired from his regular ministrations. His *Autobiography and Memoir* was published by his sons.

GUTHRIE, WILLIAM: political, historical, and miscellaneous writer: 1708-1770, Mar.; b. at Brechin, Forfarshire, Scotland. He was educated at King's College, Aberdeen. At an early period he removed to London, where he worked

GUT MANUFACTURE—GUTTA.

hard for forty years as a man of letters. Among his various works are a *History of England* (3 vols. Lond. 1744-50), and *A Historical and Geographical Grammar* (1st ed. 1770; 24th ed. 1827), a manual of information which had immense popularity in its time.

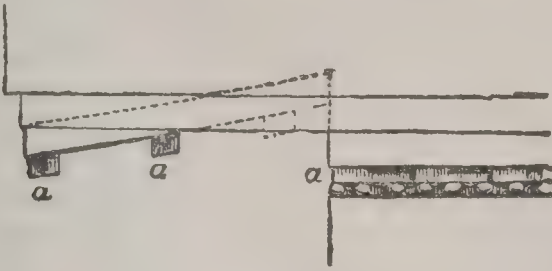
GUT MANUFACTURE: unpleasant though important series of operations in preparing the membranes of animal intestines for various useful purposes. The French call it *boyawderie*, from *boyau*, intestine, and have placed it under stringent legal regulations, on account of its offensive and pestiferous character, especially when conducted in a populous part of a town, as at the Rue de la Boyawderie, in Paris. For one branch of it see **GOIDBEATERS' SKIN**. *Cat gut*, as it is called, is made from the intestines of sheep, which are first cleansed and freed from loose fat, then prepared by soaking and partial putrefaction, to loosen the different membranes of which the intestine is composed. These are then separated by scraping, then further soaked in clean water and scraped separately. After this they are treated with a solution of potash, and drawn by women through a sort of thimble, and sorted for twisting into threads. They are then exposed to fumes of sulphurous acid, given off from burning sulphur, which deodorizes them and prevents subsequent putrefaction. The small intestines are used for cat-gut, the large intestines are simply scraped and salted, for the use of sausage-makers and by confectioners, and for tying over preserve and pickle jars, etc. The coarser kinds of cat gut strings are used for pulley and lathe bands, strings for archery-bows, drill bows, hatters' bows, and other purposes where a strong cord subject to friction is required; the finer kinds are twisted into whip-cord, and are used for fishing-tackle and the strings of musical instruments. For the latter purpose the best quality is required. The very best, called *Roman strings*, are made chiefly at Milan. It is said that the Italian sheep are lean and that the membranes of lean animals are tougher than those which are highly fattened and rapidly fed up to marketable size.

GUTS MUTHS, *gôts môts*, JOHANN CHRISTOPH FRIEDRICH: 1759, Aug. 9—1839, May 21; b. Quedlinburg, in Prussian Saxony; German instructor of youth. He studied at Halle, and subsequently became attached to Salzmann's institution at Schnepfenthal. There he applied himself to the elaboration, theoretical and practical, of Gymnastics (q.v.) as a branch of education; and from him it has passed into the curriculum of other German institutions. In 1793 G. published *Gymnastik für die Jugend*, which has become a classic on the subject, and the basis of all subsequent treatises. G. M. was distinguished also as a writer on geography.

GUTTA, n. *güt tã* [L. *gutta*; It. *gotto*; F. *goutte*, a drop]: a drop; concrete juice. **GUTTA SERENA**, *-sé-rē'nã* [L. clear drop]: old name for Amaurosis (q.v.), loss or decay of sight from palsy of the optic nerve. **GUT TATED**, a. besprinkled with drops. **GUTTÆ**, n. plu. *-tē*, in *sculp.*, pendent ornaments, like drops, attached to the underside of the Mutules (q.v.), and under the triglyphs of the Doric

GUTTA.

order (see fig. under COLUMN). They are generally in the form of the frustum of a cone, but sometimes cylindrical. It is not clear what their origin may have been, whether, as the name indicates, they represent drops of water or icicles. Alberti calls them nails; and it seems likely that as many other parts of Greek architecture have been shown to be de-



a, a, a, Guttæ:
From Cornice of Parthenon.

rived from structural conditions (see ENTABLATURE), these also should owe their origin to a similar cause. They were probably derived from the wooden pins or plugs, more commonly used than iron nails, and of which it is still usual to leave the ends projecting in any large wooden structure, such as the centering of a bridge. Whatever their origin, they were modified by the Greeks into a graceful ornament.

GUTTA-PERCHA.

GUTTA-PERCHA, n. *gūt'tū-pēr'chă* [Mal. *gátah*, gum; *percha*, the tree from which it is obtained]: substance in many respects similar to caoutchouc, is the dried milky juice of a tree, *Isonandra Gutta*, growing in the peninsula of Malacca and the Malayan archipelago. The tree belongs to the nat. ord. *Sapotaceæ*. It is very large, the trunk sometimes three ft. in diameter, though it is of little use as a timber tree, the wood being spongy. Its geographical distribution is very limited. The leaves are alternate, on long stalks, obovate-oblong, entire, somewhat leathery, green



Gutta-Percha:

1, a flower; 2, a pistil; 3, a branch with leaves and flowers; 4, transverse section of ovary; 5, vertical section of ovary; 6, transverse section of fruit; 7, fruit, scarcely mature; 8, anther.

above, and of golden color beneath. The flowers are in little tufts in the axils of the leaves, small, each on a distinct stalk; the corolla having a short tube and six elliptical segments; they have 12 stamens and one pistil. The present mode of obtaining G.-P. is most destructive. The finest trees are selected and cut down, and the bark stripped off; between the wood and bark a milky juice is found, which is scraped up into little troughs made of plaintain leaves. This is the G.-P., which, as it hardens, is kneaded into cakes, and exported.

G.-P. was known in Europe long before its peculiar character and uses were discovered. It was from time to time brought home by voyagers, in the form of drinking-bowls, which excited curiosity on account of the material of which they were made. Some thought it a species of india-rubber, others asserted it to be a kind of wood, which they named *mazer-wood*, from its use in making these drinking-cups. Dr. William Montgomerie of the *Indian Medical Service*, who introduced it into England 1843, was rewarded by the gold medal of the Soc. of Arts. He first noticed that the

GUTTA-PERCHA.

Malays used it for making handles to their knives, etc.; and it immediately occurred to him that it might be of great use in a variety of ways, especially in making handles for surgical instruments. The importation of it to Europe and America has reached immense proportions. The imports into Britain alone (1876-80) varied from 21,000 cwts. to 66,000 cwts. It is used for a vast variety of ornamental and useful articles: one important application has been the coating of marine electric telegraph wires. For this application, it has a serious inherent defect, arising from the readiness with which it becomes oxidized and decomposed. Its great value is in the ease with which it can be worked, and its being so complete a non-conductor of electricity. It softens in warm water, and can be molded into any form in that state; as when soft it is not sticky, and turns well out of molds. It will always be of great value as a material in which to take casts, as it can in the soft state be made to take the sharpest forms most faithfully, and as it quickly becomes hard, and preserves its shape if not too thin, the range of its utility in this respect is very extensive.

It is imported in blocks and lumps of five to ten lbs., in various forms, chiefly like large cakes, or rounded into gourd-like lumps. It has a very light reddish-brown, or almost a flesh color, is full of irregular pores elongated in the direction in which the mass has been kneaded. It has a cork-like appearance when cut and a peculiar cheese-like odor. Before use, it has to undergo some preparation. This consists in slicing the lumps into thin shavings, which are placed in a *devilling* or tearing machine revolving in a trough of hot water. This reduces the shavings to exceedingly small pieces, which by the agitation of the tearing-teeth, are washed free from many impurities, especially fragments of the bark of the tree, which, if not separated, would interfere with the compactness of its texture, which is one of its most important qualities. The small fragments, when sufficiently cleansed, are kneaded into masses which are rolled several times between heated cylinders, which press out any air or water, and render the mass uniform in texture. It is then rolled between heated steel rollers into sheets of various thickness for use, or is formed into rods, pipes for water, or speaking-tubes, and an endless number of articles.

G.-P. differs materially from caoutchouc or india-rubber in being non-elastic, or elastic in only a very small degree. Nevertheless, the two articles are often confounded in the public mind, probably from the similarity of their application. It is probable that india-rubber will eventually displace gutta-percha in some of its most important applications, especially in the coating of telegraph wires, to which purpose it has been successfully applied in the United States. There are two or three kinds of G.-P. known in commerce, and it is almost certain that these are yielded by different species: that from Singapore is esteemed the best, and is distinguished by the Malay traders as *Gutta Taban* or *Tuban*; that of Borneo is of less value—this is called *Gutta Percha* by the traders, and has given the gen-

GUTTA ROSEA—GUTTER.

eral name to all; and another kind goes by the name of *Gutta Girek*. The first two are those generally known in European and American markets.

G.-P. is turned by surgeons to various uses, chiefly for splints and covering moist applications to retard evaporation. A splint of G.-P. is made by taking a rigid board of the substance cut to the desired shape, soaking it in hot water, and then bandaging it to the limb. In a few minutes the G.-P. is found hard, and modelled to the shape of the parts. The cloth of G.-P. is sometimes used instead of oiled silk, as it is about half the price: it is, however, liable to tear, does not stand much heat, and is less flexible. G.-P. being readily soluble in chloroform, such a solution is sometimes used for covering raw surfaces, as when the chloroform evaporates, it leaves a pellicle of solid gutta percha. It has been used also for stopping hollow teeth.

GUTTA ROSEA, *gŭt ta rōzē-a*: a kind of cutaneous eruption on the face, popularly called 'brandy blossoms,' from its frequent occurrence in dissipated persons advanced in life. It is very difficult of cure, and to be treated chiefly by a careful regimen.

GUTTÉ, *gŭt-ā*. or **GUTTY**, *gŭt'ī* [Lat. *gutta*, a drop]: in heraldry applied to a field, or any particular charge on the field, covered with drops. When the drops are red, they represent drops of blood, and the bearing is said to be *gutté de sang*: in this case, some great suffering or labor, such as fighting for the recovery of the Holy Land, is indicated. When they are blue, they represent tears, and the bearing is said to be *gutté de larmes*. When white, they are called drops of water, and the bearing is described as *gutté de l'eau*; but Nisbet is of opinion that tears are intended in this case also, and that repentance or penitence is signified by both.

GUTTER, n. *gŭt tēr* [F. *gouttière*, a channel or gutter—from *goutte*, a drop—from L. *gutta*, a drop: Low Ger. *guddern*, to gush out]: a channel or hollow for conveying water; any hollow piece of wood or metal for conveying waste water: V. to form into small hollows or channels. **GUTTERING**, imp. **GUTTERED**, pp. *-terd*: **ADJ.** cut into gutters or small hollows.

GUTTER, in Architecture: open channel for conveying water from buildings, roads, etc. Gutters are necessary for preservation of such structures, and have been in use in all ages. The Greeks, who constructed their roofs with a simple span, used gutters at the eaves of their buildings, hollowed out of the stone which formed the cornice. These gutters discharged their contents on the ground at intervals through small Gargoyles (q.v.), usually in the shape of lions' heads. The Romans followed this example, and formed gutters also with tiles laid in cement.

In the middle ages, the eaves seem to have been left without gutters, until as the castles were frequently on dry rocky sites, it was found desirable to collect the rain-water and preserve it in cisterns. Stone or wooden eaves, gutters, and pipes were used for this purpose. In ecclesiastical

GUTTIFERÆ—GUTZKOW.

architecture, when the construction became complicated, it was necessary to convey the water from the roofs with great care, to prevent damage to the building. It was collected at the eaves of the central roof, and by means of well-projected gargoyles, thrown along channels formed in the crest of the buttresses and so carried beyond the walls of the building, and thrown off through gargoyles in a number of small streams, which dispersed the water before it reached the ground. This acted well in calm weather, but during storms the water was blown back all over the building, which, in case of its being of a porous stone, softened and became liable to decay. This led to the use of lead pipes, which carried the water directly to the ground, and discharged it into open gutters. At first, the pipes were used for conveying the water from the main roof to the roof of the side-chapels, whence it was discharged by gargoyles. Pipes conveying the water to the base of the building were employed first in England, where they seem to have come into use in the 14th c.: they were formed with great taste, and had ornamental cups or cisterns at top to receive the water from the mouth of the gargoyle. They were then, with considerable foresight, made *square* in form, not circular, as they usually now are. The advantage of the square section is, that if the water in the pipe be frozen, there is room for the expanding ice to swell out by slightly changing the form of the square.—See SEWAGE.

GUTTIFERÆ, *gūt-tīf'ēr-ē*, or CLUSIACEÆ, *klū-sī-ā'sè-é*: natural order of exogenous plants, consisting of trees and shrubs, natives of tropical countries, generally secreting an acrid yellow resinous juice. A few are epiphytes. The leaves are opposite, destitute of stipules, leathery, and entire. In botanical characters, this order is allied to *Hypericaceæ*. It contains about 150 known species, the greater part S. American, though all tropical countries produce some. The resinous secretions of some are valuable, particularly of those trees which yield Gamboge (q.v.) and Tacamahaca (q.v.): see also CLUSIA.—A few species afford valuable timber: see CALOPHYLLUM.—The flowers of some are very fragrant; those of *Mesua ferrea* are found in a dried state in every bazaar in India, and are used as perfume.—The fruit of some is very highly esteemed; the Mangosteen (q.v.) has been described as the finest fruit in the world. The Mammee Apple (q.v.) is another of the most celebrated fruits of this order.

GUTTIFEROUS, a. *gūt-tīf'ēr-ūs* [L. *gutta*, a drop; *fero*, I bear]: yielding gum or resinous substances.

GUTTULATE, a. *gūt-tū-lāt* [L. *guttulī*, a little drop]: in bot., in the form of small drops; composed of small round vesicles.

GUTTURAL, a. *gūt'tēr-āl* [F. *guttural*—from mid. L. *gutturālīs*—from *guttur*, the throat]: formed in the throat; pertaining to the throat: N. a letter pronounced in the throat. GUT'TURALLY, ad. -lī.

GUTZKOW, *gōts'ko*, KARL FERDINAND: 1811, Mar. 17

GUTZLAFF.

—1878, Dec. 16; b. Berlin: author. He was educated at the Friedrichswerder Gymnasium; studied philosophy and theol. at the Univ. of Berlin; became leader of the Young Germany party 1830; started a newspaper 1831; went to Stuttgart to assist in editing Menzel's *Literaturblatt*; continued his studies in the universities of Jena, Heidelberg, and Munich; engaged in journalism in Frankfort; was imprisoned three months and had all his writings suppressed for the atheistic and socialistic views expressed in his novel *Wally, die Zweiflerin* 1835; and the same year elaborated his opinions in *Nero*, a dramatic work. To escape the surveillance of the Prussian govt., he went to Hamburg 1837, thence to various German cities, and 1870 made his permanent residence in Berlin. He was author of numerous comedies, tragedies, dramas, and novels, which attained wide popularity but exerted a baneful influence.

GUTZLAFF, *güts'láf*, KARL FRIEDRICH AUGUST: German missionary to China: 1803, July 8—1851, Aug. 9; b. Pyritz, in Pomerania. At an early age he was apprenticed to a belt maker in Stettin. Here he composed a poem, in which he expressed his earnest wish to become a missionary to the heathen, and 1821 presented it to the king of Prussia. The king caused him to be placed in the missionary institution at Berlin. At the expiration of two years, he was removed to the Dutch missionary society at Rotterdam, and 1826, Aug., was sent to Sumatra. Being detained at Java, he fixed his residence at Batavia, where he applied himself to the study of Chinese. At the end of two years, having acquired considerable knowledge of the language, and familiarized himself with the habits of the Chinese residents in Batavia, he determined to give up his connection with the Dutch society, and devote himself to the conversion of the Chinese. He joined Tomlin, the English missionary, and, in the summer of 1828, accompanied him to Siam. They settled at Bangkok, the capital, partly for the purpose of preaching the gospel, partly to render themselves thoroughly acquainted with the Siamese language, and to perfect themselves in Chinese. For the sake of his health, he now, by the advice of a Chinese friend, undertook a voyage to China; and from this time, Macao became his principal station, and here he formed an intimate friendship with Robert Morrison. In conjunction with Medhurst and two other friends, G. began a new translation of the Bible into Chinese. With the assistance of Morrison, he founded a society for the diffusion of useful knowledge in China, published a Chinese monthly magazine and preached at Macao and elsewhere. Compare his *Journal of Three Voyages along the Coast of China in 1831, 1832 and 1833, with Notice of Siam, Corea, and the Loo-choo Islands*. After the death of the elder Morrison, G. was appointed chief interpreter to the British supervisional govt. in China, with a salary of £800. In this capacity he attempted 1835, May, to penetrate into the interior of the province of Fo-kien, but without success. At the same time, the printing of Christian books in the Chinese language, and even the distribution of Christian writings among

the inhabitants of Canton, were prohibited. Thus restricted in his missionary career, G. joined the British during the war with the Chinese and his thorough acquaintance with the Chinese, rendered his services of great value. He likewise contributed to bring about the peace in 1842. Finally, in 1844, he founded a Chinese society, for the purpose of diffusing the gospel, by means of native Christians, in the interior of the country: this had such success that during the first four years as many as 48 Chinese were sent by it as Christian workers among their own people. To promote the objects of the mission, he returned to Europe 1849, and visited England, Germany, and other countries. He returned to China, landing at Hong Kong 1851, Jan., but died there in the same year. G. published various works in different languages, some of which are extremely valuable; the principal are *Geschichte des Chines. Reichs* (Stuttg 1847), and *The Life of Taokuang* (Lond. 1851).

GUY, n. *gī* [Sp. *guia*, a guide; *guiar*, to guide: Scot. *gy*, a rope]: in a *ship*, a rope used to keep a heavy body steady while hoisting or lowering; a wire rope, chain, or rod to steady and prevent undulations in a suspension bridge.

GUY, n. *gī*: a grotesque effigy of *Guy Fawkes*; a person dressed in an odd or fantastic manner.

GUY, *gī*, THOMAS: founder of Guy's Hospital, Southwark, London: 1644-1724, Dec. 17; b. Horseleydown; son of a Southwark lighterman and coal-dealer. He began business as a bookseller with a stock of about £200, dealing extensively in the importation of English Bibles from Holland (those printed at home being executed very badly); and, on this being stopped, contracted with the Univ. of Oxford for the privilege of printing Bibles, which he continued many years. His principal gains, however, arose from the not very creditable practice of purchasing, during Queen Anne's wars, the prize tickets of seamen at a large discount; and subsequently investing them in South Sea Company's stock, by which means he amassed a fortune of nearly half a million sterling. In 1707, he built and furnished three wards of St. Thomas's Hospital. In building and endowing the hospital in Southwark which bears his name, he set apart £238,295,16s. He was also a liberal benefactor to the Stationer's Company, and built and endowed almshouses and a library at Tamworth. Besides making bequests to Christ's Hospital, and various other charities, he left £80,000 to be divided among those who could prove any degree of relationship to him. He was of mean appearance, with a melancholy expression of countenance, and during his whole lifetime had no other reputation than that of a selfish and avaricious man.

GUY'S HOSPITAL. The first stone of the building was laid 1722, and the hospital admitted its first patient 1725, a few days after the death of its founder. The whole expense was £18,796,16s., great part of which Guy expended in his lifetime, and he bequeathed £219,499 to endow it. In 1829 Mr. Hunt bequeathed to the hospital £190,000, and additional bequests to the amount of £10,000 have since

been received. There was at first room for about 400 patients; now 700 can be accommodated. The yearly average of patients is over 3,000; the out-patients relieved may amount to 50,000. The annual income is about £40,000. The usual number of governors is 60, self-elective. Students enter the hospital for study, attending chemical practice, lectures, etc., and paying annual fees. A library and valuable museums, also a chapel, are attached to the hospital. Sir Astley Cooper, the eminent surgeon, is buried in the chapel.

GUYON (or GUION), *gī'on*. F. *ghe-yōng'*, JEANNE MARIE BOUVIERES DE LA MOTHE: leader of the mystic Quietists in the 17th c. (see QUIETISM): 1648, Apr. 13—1717, June 9; b. Montargis, France. Her family removed to Paris 1663; and her beauty and brightness of mind drew many admirers. She had intended to enter the cloister, but at the earnest solicitation of her family married, at the age of 15, M. Guyon, 22 years her senior, son of a rich contractor of public works. Her married life was not very happy, and being left a widow at 25, and still retaining her early religious leanings, she transferred her three children to the care of guardians, settling on them almost all her property. Being thus entirely withdrawn from secular affairs, she attracted much notice by the high tone of spirituality which her conversation breathed, and was invited by M. d'Arenthon, Bp of Geneva, to settle in his diocese, where she formed the acquaintance of a Barnabite, Père Lacombe, then in much repute as a director of souls. The mystic doctrines which she learned from this ecclesiastic, and which involved such a degree of self-abnegation as to suppose that the truly Christian soul must become indifferent not only to life and death, but even to its own salvation or perdition, having come to the knowledge of the bishop, he withdrew his protection from Madam Guyon. In consequence she left Geneva, and accompanied by Père Lacombe, went to various cities of Italy and France, and eventually to Paris, where they drew about them a number of followers. The reputed extravagances of Madame G., led to her being shut up by a royal order in the convent of the Visitation, from which, however, she was set free, at the instance of Madamede Maintenon, and through this lady obtained entrance into the highest circles of Paris and Versailles. It was now that she formed the acquaintance of Fénelon, who was completely won by her evidently sincere piety and captivated by the earnestness and lofty spirituality of her views. He failed to see the evil consequences which they involved; and the confiding zeal with which he defended her not only against the misrepresentations with which she was assailed, but even against the too well founded imputations which her principles had drawn upon her, was the cause of his unhappy rupture with Bossuet: see FÉNELON. Madame G. having submitted her writings to Bossuet and other members of a royal commission, subscribed 24 articles which were drawn up by them, and promised to abstain from all further speculation on these subjects. But she failed to keep her promise, and not only drew again upon

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herself the hostility of the court, but also became the object of much scandal on account of her intimacy with Père Lacombe. That the latter imputation was a calumny, it is impossible to doubt; but Madame G. was again put under arrest, and imprisoned first at Vincennes and Vaugirard, and ultimately in the Bastille. She was liberated 1702, and henceforth lived in comparative privacy till her death, which took place at Blois 1717. She is the author of several works, the chief of which are *Torrents Spirituels*, *Moyen Court de Faire Oraison*, and *Le Cantique des Cantiques interprété selon le sens mystique*, together with an Autobiography and Letters, as also some spiritual poetry.

GUYON, *gīon*, RICHARD DEBAUFRE: 1813-56; b. Walcott, near Bath, England: general in the Hungarian army 1848-9. After having fought against Dom Miguel in Portugal, G. entered the Austrian service in 1832; was attached as aide de-camp to Baron Splényi, whose daughter he married 1838. From that time till the outbreak of the revolution, G. led the life of a country gentleman on his estates near Comorn, but was among the first and most prominent in the struggle for independence. During the retreat of Görgei's army, G. carried the mountain pass of Branyiszko, and by that daring feat re-established communication with the government at Debreczin, as also with the several other Hungarian army corps. When, 1849, Apr., the garrison of the besieged fortress Comorn was to be apprized of the victorious approach of the national army, G., with a detachment of hussars, cut his way through the enemy's lines, and announced the approaching relief. The bloody affair of Széreg allowed Dembinski, protected by the self-sacrificing ten battalions of G., to retire to Temesvár, where the last battle of the Hungarians was fought and lost Aug. 9. G. escaped to Turkey, and entered the service of the sultan, without being compelled to turn Mohammedan. Under the name of Kourshid Pasha, he, as a gen. of division, was gov. of Damascus, and at the beginning of the Crimean war, did much to organize the army of Kars. He died at Constantinople. Indomitable courage, and incessant care for the comfort of the troops under his command, were chief features in G.'s character.

GUYOT, *ge-ō'*, ARNOLD HENRY, PH.D., LL.D. 1807, Sep. 28—1884, Feb. 8; b. Neuchâtel, Switzerland: geographer. He was educated at Chaux-de-Fonds, Neuchâtel, Carlsruhe, the Stuttgart Gymnasium, the Univ. of Berlin, where he graduated 1835, and in Paris 1825-29. His early intention was to prepare himself for the ministry, but he included philosophy and natural science in his studies, and through the friendship of Agassiz (q.v.) and Humboldt (q.v.) was led to a special investigation of geographical science. In 1835 he published a thesis on *The Natural Classification of Lakes*, 1838 reported the results of a six-weeks' examination of Swiss glaciers to the French Geographical Soc., and 1839 became colleague of Agassiz as prof. of history and physical geography in the Neuchâtel

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Acad. He remained there till suspension of the acad. by the revolutionary council 1848, and in the meantime discovered the laminated character of glacier ice, determined the cause of glacier movement, investigated the transportation of Alpine boulders around the central Alps, and made other contributions to physical geography. In 1848 he removed to the United States, delivered a course of lectures in the Lowell Institute, Boston, and was employed by the Mass. Board of Education as a lecturer on physical geography for six years. In 1854 he was appointed prof. of geology and physical geography in the College of New Jersey, and held the office till his death. Besides his labors there he was for several years lecturer on physical geography in the N. J. State Normal School, and on the connection of revealed religion and physical and ethnological science in the Princeton Theol. Seminary, and delivered special lectures in the Union Theol. Seminary and Columbia College. He organized a system of meteorological observations for the Smithsonian Institution; was an original member of the National Acad. of Sciences, and honorary or corresponding member of the leading scientific societies of the world; received the medal of progress at the Vienna exhibition for his geographical works 1873, and the gold medal at Paris 1878. He published a series of school geographies (1866-75), and a set of school wall-maps; was (with Pres. Barnard) editor of *Johnson's New Universal Cyclopædia* (1874-77); contributed numerous papers to the *American Journal of Science*; and shortly before his death completed *Creation; or, The Harmony between the Mosaic Cosmogony and the Facts of Science*. Among his works are, *The Earth and Man*, and *Man Primeval*.

GUZEL'-HISSAR': see AIDIN.

GUZERAT, *gŭz-é-rât'*, or GUJARÁT, *gŭj-ér-át'*: geographical division of India, n. lat. 20°—34° 45', and e. long. 69°—74° 20'; about 50,514 sq. m. Pop. (1891) 5,536,490. Its most important section, perhaps, is the peninsula of Kattywar, which projects into the Arabian Sea between the Gulf of Cutch on the n.w. and the Gulf of Cambay on the s.e. Of the mainland, a considerable portion is shut out from the sea by the British districts of Broach and Surat, so that the peninsula comprises nearly the whole of the coast-line and most of the available harbors. With regard, however, to internal communications, the mainland has the advantage of the peninsula, being traversed by the Nerbudda and the Tapti, beside streams of less magnitude. To the s. of the last-mentioned river, G. presents the n. extremity of the Western Ghauts. The products are rice, wheat, barley, sugar, tobacco, castor oil, maize, opium, cotton, and fruits. Within the limits of G. (also spelled *Gujarat* or *Gujerat*) lie the Guicowar's territory, and the numerous petty states of Kattywar, Mahi Kanta, and Rewa Kanta.—The name G. often includes also the British administrative division under the gov. of Bombay, which comprises the districts of Surat, Broach, Kaira, Panch Mehals, and Ahmedabad.

GUZERATI—GWINNETT.

GUZERATI, n. *gû-zer-â'tî*, or **GOOZERA'TEE**, n. *-â'tê* [native word]: native of Guzerat in India; the language spoken in that region. It was probably at first a Turanian language or dialect, but is now completely transformed by the introduction into it of a great multitude of words derived from Sanskrit.

GUZZLE, v. *gûz'zî* [Swiss, *gutzeln*, to shake liquids in a flask: It. *gossare*, to guzzle—from *gozzo*, the throat: OF. *gouzeiller*, to gulp up, to swallow down]: to drink much and greedily; to drink often. **GUZZLING**, imp. *gûz'ling*. **GUZZLED**, pp. *gûz'zîd*. **GUZZLER**, n. *gûz'lér*, an immoderate drinker.

GWALIOR, *gwâ'lê-awr*: hereditary dominions of the Mahratta chief Sindia (q.v.). It comprises several detached districts, about 28 000 sq. m. in the n.w. of India, e. long. 74° 45'—79° 21'. Lying partly in the basin of the Jumna and partly in that of the Nerbudda, it divides its drainage between the Bay of Bengal and the Arabian Sea. Though G. is a Mahratta principality, in fact, the principal fragment of the great empire of the Peishwa, yet only s. of the Nerbudda do the Mahrattas form any considerable proportion of the people. Under such circumstances, therefore the dominant race can maintain its supremacy by force alone. Since 1803, the country has been under British protection, though the existing relations of the two parties date only from 1844. In 1843, the death of the sovereign, producing universal anarchy, led to the forcible interposition of the British govt.; and by the treaty of 1844, Jan., in addition to a large contingent under British authority, the native govt. was permitted to have 9,000 troops of its own. During the troubles of 1857, the new Maharajah, not more than 22 years old, remained faithful to the English, notwithstanding the almost entire defection of both divisions of the military force. Pop. (1881) 2,993,652; (1901) 2,933,001.

GWALIOR: capital of the state of G. in central India; near the n.e. extremity of its straggling territory. Its nucleus is an isolated rock about 340 ft. in height, perpendicular, either naturally or artificially, on all sides; and as it measures 1½ m. by 300 yards, it can accommodate a garrison of 15,000 men. It is thus virtually impregnable against any native force. The spot is understood to have been occupied as a stronghold for more than a thousand years, and the summit has been provided, from time to time, with several spacious tanks. Along the e. base of this eminence lies the town of G., containing little worthy of notice but a beautiful mausoleum of white sandstone; and to the s.w. there extends for several miles the Lashkar, or camp of the Maharajah's own army, while n.e. is the Moorar, or cantonment of the protecting contingent. During the troubles of 1857-8, the place attained unenviable notoriety as a centre of rebellion, having, notwithstanding the fidelity of the Maharajah himself, been, for more than a year, in the power of the insurgents. Pop. abt. 30,000.

GWINNETT, *gwîn-nêt'*, **BUTTON**: abt. 1732-1777, May

27; b. England: signer of the Declaration of Independence. He was educated for a mercantile career, established himself as a trader in Savannah 1765, and engaged in agriculture on St. Catharine's Island, Ga., 1770. In 1775 he was active in public affairs; 1776 was a representative in congress, signed the Declaration of Independence, and was elected representative for the following term; 1777 became a member of the Ga. state govt. and pres. of the provincial council, and died from a wound received in a duel with Gen. McIntosh.

GWYNIAD, *gwin'î-ad* or *gwin'yad* (*Coregonus Pennanti*): one of the British species of *Coregonus* (q.v.) which, from their form, the large size of their scales, and their silvery appearance, are sometimes called *Freshwater Herring*, and are vulgarly identified with the herring. The general similarity is in this case very great. The G., full grown, is 10 or 12 inches in length; the first dorsal fin is high; the snout is a little produced; the mouth is small, the jaws without teeth, a few minute teeth on the tongue only. It



Gwyniad (*Coregonus Pennanti*).

is found in some larger lakes of N. Wales and Cumberland. G. is a Welsh name, and means 'shining'. At Ullswater, the fish is called *Schelly*. It occurs in that lake in great shoals, so that many hundreds are sometimes taken at a single draught of the net. It is rather an insipid fish, and cannot be kept long after being taken out of the water unless salted, which it often is by the poor. The Freshwater Herring of Loch Lomond is not the G., but the Powan. Many of the species of this genus, however, very nearly resemble each other, and are not easily distinguished by mere description. It is curious that a fish in British Columbia is called by the natives *quinnat*, which also means 'shining.'

GWYNN, *gwin* (or GWINN), ELEANOR, or NELL: about 1650-90; b. London: mistress of King Charles II. She was born in poverty and reared in vice; became an orange peddler, a tap-room dancer and singer, and the mistress of several actors; went on the stage when 16 years old, and attained popularity in pieces where dancing and singing were provided; became mistress of Lord Buckhurst when 17 years old; and was surrendered by him to the king two years afterward. Charles was exceedingly attached to her, provided her an independent establishment, appointed

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her a lady of the queen's privy chamber, and erected Chelsea Hospital for disabled soldiers at her request. She bore him two sons, was liberal to actors and poets, was reputed a supporter of the Prot. cause at court, was the subject of the king's dying words, and at her death Dr. Tenison—afterward abp. of Canterbury—preached the funeral sermon.

GYARMAT-BALASSA, *dyör-möt' böh-lösh'shōh*, or **BALASSA-GYARMAT**: town of Hungary, county of Neograd, 42 m. n. by e. from Pesth, on the left bank of the Eipel or Ipoly. The surrounding district is very beautiful and fertile, producing much excellent wheat. Near the town are the ruins of a castle, formerly belonging to the Balassa family, and famous as having been more than once heroically defended against the Turks. Pop. about 8,000.

GYBE, or GIBE: see **JIBE**.

GYGES, *jī'jēz*: founder of the third (or Mermnad) dynasty of Lydian kings: reigned about B.C. 687-654. Nyssia, wife of Candaules, King of Lydia, having been grievously affronted by her husband in presence of G., ordered the latter, who was in high favor with his sovereign, either to slay Candaules or to prepare for his own fate. (Compare the history of Rosamund, wife of Alboin, King of the Lombards; Gibbon, V. 339, Murray's ed.) G. accordingly put his master to death, married Nyssia, and assumed the supreme power. The Lydians, however, refused to acknowledge his authority, until the oracle of Delphi declared in his favor. In return for this service, he made immense presents to the sacred shrine. He is said to have amassed enormous wealth, so as to give origin to the proverb, 'the riches of Gyges.' The successors of G. were Ardys, Sadyattes, Alyattes, and Cræsus, who was defeated by Cyrus the Great B.C. 546 (or 548). The Lydian empire was thus overthrown. Plato has a fable, in which G. is represented as a shepherd of Candaules; but having miraculously obtained possession of a golden ring of great virtue, he was enabled by means of it to make himself invisible when he chose, and thus took occasion to murder his sovereign, and usurp the supreme power. The ring of G. is frequently mentioned in the middle ages.

Gyges in anc. myth. was the name also of the hundred-handed giant, son of Cælus and Terra, who with his brothers made war on the gods, and after his overthrow, was subjected to everlasting punishment in Tartarus.

GYLE-TUN, n. *jīl-tān*: a tun or vessel used by brewers.

GYMNADENIA, n. *gīm na-dēn'ī-a* [prefix *gymn*; Gr. *adēn*, a gland]: typical genus of *Gymnadenidæ*, family of orchids, tribe *Ophreæ*.

GYMNASIUM.

GYMNASIUM, n. *jīm-nā'zī-ŭm* [L. *gymnāsīŭm*; Gr. *gumnāsion*, in anc. times, a place where men wrestled naked—from Gr. *gumnos*, naked]: a school for gymnastics, or athletic exercises; in *Germany*, a grammar or high-school (see **GYMNASIUM**, below). **GYMNASTICS**, n. plu. *-nās tīks*, physical exercises tending to the improvement of health and strength, and muscular development (see below). **GYM'NAST**, n. *-nāst*, one who teaches or practices gymnastics. **GYMNAS'TIC**, a. *-nās'tīk*, of or relating to gymnastics. **GYMNAS'TICALLY**, ad. *-lī*. **GYMNA'SIARCH**, n. *-nā'zī-ārċ* [Gr. *archos*, chief]: in *anc. Greece*, the chief officer of a gymnasium. **GYM'NIC**, a. in *OE.*, practicing athletic or gymnastic exercises; pertaining to the exercises of the gymnasium.

GYMNA'SIUM: in ancient Greece, a public place or building where youths exercised themselves. In Athen, alone there were seven resorts of this kind. Philosophers also gave instruction in these *gymnasia*; hence the transference of the name to public buildings erected for the mental disciplining and instruction of youth. The German G. corresponds roughly to the grammar and public schools of England, and the grammar schools and high endowed academies of the United States. All these classes of schools in Europe had their origin in the cathedral and monastery schools of the pre-reformation period. The widening circle of human knowledge in the 17th and 18th c. made itself felt in these educational seminaries, as in the universities. Their curriculum became gradually extended, and with the further increase and development of universities, their aims became still higher. In Germany, as in Britain and America, the classical tongues formed and continue to form the great instrument of mental discipline in schools of this higher class, though other subjects have been added from time to time. The subjects of instruction first added to the classical tongues were geography and history. The natural sciences and mathematics, the pursuit of which has formed a characteristic feature of this century, gradually found place in the school-room; and the study of the mother-tongue and of modern languages was admitted. For a time these subjects held a co-ordinate place with Latin and Greek. Departmental studies were taught with ardor, and educators were sanguine of the results which would flow from early initiation into the results and processes of the various sciences. These anticipations seem to have been not fully realized in Germany, and there has for some time been a movement toward the restoration of classical or humanistic studies to be the main instrument of education, while retaining other subjects as a subordinate portion of the curriculum. The idea, however, of the G. as specially a preparatory school for the university, and therefore not suited to all classes indiscriminately, has been more steadily kept in view in Germany than in the other countries, and the consequence has been the breaking up of the middle school or G. into two—the G. proper, where those are taught who propose to enter the universities, or who desire

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a partial classical training; and 'real-schools,' where elementary science, foreign languages, and mathematics are the principal subjects of instruction. In this respect, the middle-school education of Germany has advantages over that of England, and perhaps still more over that in the United States. It is not to be supposed, however, that in the latter countries the great grammar schools are less efficient in their classical training; the contrary is probably the fact, so far as concerns the principal schools, such as Eton, Harrow, and Rugby, in England; and Phillips Acad., Phillips Exeter Acad., the Boston Latin School, and several others in the United States. But the methodized system of examinations, and the more rigorous methods of Germany, seem to turn out a larger *proportion* of well-instructed boys from each school, while the influence of central authority secures greater uniformity of processes and results throughout the country. The boys attend till they reach the age of 18, when, after a special examination (the abiturient or maturity examination), they are transferred to the university. The German gymnasiums differ from English public schools and American high academies for the middle and higher classes, in being day-schools, and not the centre of great boarding establishments. In this respect they resemble the Scotch grammar and high-schools, and the high-schools in the common-school system of our own states.

GYMNASTICS: physical exercises, not amounting in intricacy to games, by which particular limbs, either singly or in combination, are rendered more pliant or stronger: these exercises are arranged in a due progression, and the entire series becomes a system. Swimming, skating, boating, and games like golf (q.v.), cricket (q.v.), base-ball (q.v.), tennis (q.v.), croquet (q.v.), etc., are among the most efficient gymnastic exercises; but in this article attention is confined to exercises whose primary and direct aim is muscular development and health.

Gymnastic games are so old as to be pre-historic: they are alluded to in the 2d and 23d books of the *Iliad*. Before the time of Hippocrates, gymnastic exercises had been adopted in Greece as part of the remedial course to counteract increasing luxury and indolence. The various exercises were speedily combined into a system, and gymnasia, where they should be carried out, were formed first by the Lacedæmonians, and subsequently at Athens: see GYMNASIUM. The Romans adopted the system, and constructed gymnasia on a magnificent scale. Many of their buildings, having had extensive baths attached, were known as *Thermæ*. The exercises in the gymnasia consisted of running, leaping, dancing, wrestling, boxing, hurling, etc.; and in those days, when all men bore arms, and when, in close combat, victory went generally with the strongest man, these games were doubtless of great value. In subsequent ages of knightly prowess, similar exercises were probably practiced, though less publicly; but with the introduction of gunpowder, and through its means, the gradual substitution of fighting at a distance—in which science and skill were the main requi-

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sites—for personal encounters where strength and muscle went far to carry the day, the attention paid to G. decreased, and finally vanished altogether. To make infantry soldiers perfect in the drilled movements of masses, cavalry good horsemen and fair swordsmen, and to have gunners who could take an accurate aim, became the utmost sought by the possessors of great armies; while the science of G., having gone out of repute for the military, was speedily neglected in merely civil life. It is only within the present century that the science has at all revived.

The revival commenced in Prussia, where, about 1806, gymnasia (in the strict sense) were opened by Basedow and Salzmann, that of the latter under the superintendence of the celebrated gymnastic pedagogue Guts Muths (q.v.); Jahn followed in the same line, and rendered the science so popular that it speedily attracted the attention of the youth throughout the kingdom, and to the training thus obtained must be attributed, in no small degree, the vigor which succeeded in driving out the French army of the first empire. Sweden soon imitated Prussia, and from that time G. have been prominent in the Scandinavian course of education. In Prussia the gymnasia began to be the scenes of political gatherings, too liberal in tendency to please its semi-military government; and 1818 they were all closed. The troops were, however, continued in gymnastic exercises, and showed so clearly the advantages of the training that, about 1844, Louis Philippe adopted and improved the system in the French army. From that time, gymnasia have been constructed for almost all continental armies, and, with more or less success, for the civil population. England moved in the matter only a few years ago by establishing instruction in G. at Aldershot and other camps; in private life, however, there have long been many excellent gymnasia. In the U. S. Military Acad. at West Point, the training in G. is admirably thorough. Many colleges and universities in this country have costly buildings and apparatus, and systematic training in gymnastics.

Different instructors adopt various systems of instruction. The course in the French army is one of the best of the simpler systems. The equipment consists of a broad belt, to be strapped tightly round the waist above the hips as a support to the body. The implements most commonly required are an iron ball in a rope-sling, with a loop for the head to pass through; wrestling-handles, consisting of two wooden bars, each about 18 inches long, connected by stout cordage; a club; leaping bars, to be leaped over; and leaping-poles wherewith to leap. The system of instruction is divided into a number of 'courses' regularly graduated, beginning with elementary and special movements, with a view to render every part of the body supple, and to develop the several muscles and give complete command over all their motions (*elementary gymnastics*); and proceeding to exercises of leaping, suspension, standing and walking on beams, walking on stilts, climbing, swinging, vaulting, etc. (*applied gymnastics*).

The theory of the advantage derivable from G. is simple.

GYMNAXONY—GYMNETRUS.

Within certain limits, parts of the human frame increase in strength, aptitude, and size, in proportion to use. In G. this law is brought to bear successively on every part, and finally on the whole system in combined action. If the exertion be not carried so far as to induce excessive fatigue, all other parts of the body sympathize with the improving condition of that which is mainly exerted; the circulation, excited from time to time by the exercise, acquires fresh vigor, and blood being driven with unwonted force into all parts of the system, every function is carried on with increased activity; an improvement in the general health soon becomes manifest, and the mind—if simultaneously cultivated—increases in power and endurance.

Gymnastic exercises require to be practiced with many precautions, and always with moderation and due regard to the strength of the individual. The whole benefit may be counteracted by excess; the muscles may be overstrained, and ruptures and other serious accidents ensue. The danger of such evils from gymnastic exercises has perhaps been exaggerated; and it is to be remembered that hardihood can in no way be obtained without risk; for cricket, fencing, boating, and other manly sports, are attended with at least as much danger.

A short account of Gymnastics and Out-of-door Recreations is given in *Chambers's Information for the People*, II. Other works on the subject are—Captain Chiasso's *Gymnastics and Calisthenics*; G. Roland's *Gymnastics*; and MacLaren's *Training, in Theory and Practice*; and *Physical Education, Theoretical and Practical* (1868). Important on Gymnastic training in colleges, etc., is a paper by Prof. Edward Hitchcock, M.D., of Amherst College, in the *Tenth Annual Report of the State Board of Health of Massachusetts*. The books in German on Gymnastics (Turnkunst) would form a small library.

GYMNAXONY, n. *jīm-nāks'ō-nī* [Gr. *gumnos*, naked; *axon*, an axle-tree]: in *bot.*, a state in which the placenta protrudes through the ovary and alters its position.

GYMNE'MA: see COW PLANT.

GYMNETRUS, *jīm-nē'trūs*: genus of acanthopterous fishes of the Ribbon-fish (q. v.), family having the body much elongated, and at the same time attenuated and compressed, the dorsal fin extending the whole length of the back, the ventral fins consisting only of a single long ray, often dilated at the end; the mouth small. The fishes of this genus are inhabitants of great depths, and are rarely taken or thrown ashore. *G. remiceps* is a native of northern seas; *G. Hawkenii* has occurred on the coast of Britain; other species are tropical. It has been supposed that large fishes of this genus may have given rise to some of the stories of the Great Sea Serpent. One was lately captured at the Bermudas apparently an immature fish, but more than 16 ft. in length, and with a row of long flexile filaments on the back of the head and anterior part of the back, which might well represent the mane often ascribed to the Sea Serpent. A specimen of *G. Hawkenii*, caught on the coast of Northum-

GYMNOBLASTIC—GYMNOGEN.

berland, was exhibited in London at the time when the subject of the Great Sea Serpent excited greatest interest, and was by many supposed to explain the accounts of it, though



Gymnetrus Hawkenii.

the sea-serpent has since been seen too repeatedly by responsible observers to admit of being thus explained out of existence.

GYMNOBLASTIC, a. *jīm'nō-blās'tik* [Gr. *gumnos*, naked; *blastos*, a bud]: applied to the hydrozoa in which the nutritive and reproductive buds are not protected by horny receptacles.

GYMNOCARPOUS, a. *jīm'nō-kār'pūs* [Gr. *gumnos*, naked; *karpōs*, fruit]: in *bot.*, applied to certain lichens whose spores lie in widely open receptacles.

GYMNOCLADUS, *jīm-no-klā'dūs* or *jīm-nōk'la-dūs*: genus of trees of nat. ord. *Leguminosæ*, sub-ord. *Cæsalpinieæ*.—*G. Canadensis* is found in Canada and over a great part of the United States, attaining a height of 50–60 ft., with branches remarkable for upright direction, and an exceedingly rough bark which comes off in slips. The leaves of young trees are very large, three ft. long, bipinnate. The flowers are white in short spikes. The pods are five inches long by two broad. The tree is called *Chicot* in Canada, and sometimes *Stump Tree*, from its dead appearance in winter, and the absence of conspicuous buds. It is also called the *Kentucky Coffee Tree*, because the seeds were formerly roasted and ground as coffee in Kentucky. The wood is used by cabinet-makers and carpenters. It has very little sap-wood. The pods, preserved like those of the tamarind, are said to be wholesome and slightly aperient.

GYMNODONTS, n. pl. *jīm'nō-dōnts* [Gr. *gumnos*, naked; *odon'tes*, teeth]: applied to a family of fishes in which the jaws are covered with a substance resembling ivory, arranged in small plates representing united teeth: see **DIODON**.

GYMNOGEN, n. *jīm'nō-jěn* [Gr. *gumnos*, naked; *gennāō*, I produce]: in the botanical system of Lindley, a plant with exogenous stem and perfectly naked seeds, i.e., seeds not inclosed in an ovary. He forms of them a separate class, of which *Coniferae*, *Taxaceae*, *Cycadaceae*, and *Gnetaceae* are the orders. They are remarkable for the large apparent perforations or disks in the vessels of the wood, but they have concentric zones, spiral vessels, and a central pith, like other exogenous plants. Their great peculiarities, however, are the total absence of a pericarp, and that

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fertilization takes place directly through the foramen of the ovule, without the intervention of style or stigma.

GYMNOLÆMATA, n. plu. *jīm'nō-lē'mă-tă* [Gr. *gumnos*, naked; *laimos*, the neck or throat]: an order of the polyzoa, having the mouth devoid of the valvular structure known as the epistome.

GYMNOPHIONA, n. plu. *jīm'nōf-ĭ-ō'nă* [Gr. *gumnos*, naked; *ophis*, a serpent, *ophios*, of a serpent]: the order of the amphibia comprising certain snake-like species.

GYMNOSOMATA, n. plu. *jīm'nō-sōm-ă-tă* [Gr. *gumnos*, naked; *sōmitā*, bodies]: order of pteropodous (q. v.) mollusks, destitute of shell, having a distinct head, and swimming by fins attached to the sides of the neck. They all are marine. The *Clio borealis* of the arctic seas (see **CLIO**) is the best known and most interesting example.

GYMNOSOPHIST, n. *jīm-nōs-ō-fĭst* [Gr. *gumnos*, naked; *sophos*, wise, *sophistes*, a philosopher]: barefooted and slightly clad Hindu philosophers of a class who anciently lived solitarily in the woods, wore little or no clothing, and addicted themselves to mystical contemplation and the practice of rigorous asceticism. Strabo divides them into Brahmans and Samans, the former of whom adhered to the strictest principles of *caste*, while the latter admitted any one into their number regarding whose character and kindred they were satisfied.—**GYMNOSOPHY**, n. *-ō-fĭ*, doctrines of the gymnosophists.

GYMNOSPERMOUS, a. *jīm'nō-spēr'mūs* [Gr. *gumnos*, naked; *sperma*, seed]: having naked seeds, or seeds not inclosed in a true ovary, as Conifers. **GYMNOSPERMÆ**, n. plu. *-spēr'mă*, or **GYMNOSPERMS**, n. plu. *-spēr'mz*, plants differing from exogens in having naked ovules; plants having ovules developed without the usual integuments: see **GYMNOGENS**.

GYMNOSPORE, n. *jīm'nō-spōr* [Gr. *gumnos*, naked; *spore*, seed]: a naked spore. **GYMNOSPO'ROUS**, a. *-spō'rūs*, of or pertaining to plants having naked spores. **GYMNOSPO'RÆ**, n. plu. *-spō'ră*, the class of plants having naked spores, including fungi and algæ.

GYMNOSTOMI, n. plu. *jīm-nōs'tō-mī* [Gr. *gumnos*, naked; *stoma*, a mouth]: mosses without a peristome, or naked-mouthed. **GYMNOSTOMOUS**, a. *-tō-mūs*, naked-mouthed; without a peristome.

GYMNOTUS, n. *jīm-nō'tūs* [Gr. *gumnos*, naked; *notos*, the back]: the electric eel of S. America.

GYMNOTUS, *jīm-nō'tūs*: genus of malacopterous fishes, of which only one species is known, the celebrated *G. electricus*, or Electrical Eel. This genus gives its name to a family, *Gymnotidæ*, of which, however, no other known species has any electrical powers. The *Gymnotidæ* are mostly S. American, inhabiting the fresh waters of the tropical regions. They are eel-like in form, and like eels are destitute of ventral fins (*apodal*), but they are furnished with complete jaws and with ribs, and their fin-rays are jointed or branched. They have pectoral fins but no dor-

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sal; the anal fin is largely developed, extending either to the point of the tail, as in the electrical eel, or leaving it free. The electrical eel has the skin entirely soft and destitute of scales. It is very widely diffused over the warm parts of America, and is found both in streams and pools. For its electrical apparatus and powers see ELECTRICITY, ANIMAL. It is capable of being tamed, and when familiar, will allow itself to be handled without giving a shock, but employs its electrical powers both to kill prey and to de-



Electrical Eel (*Gymnotus electricus*).

fend itself from assailants, most frequently, perhaps, alligators. All the *Gymnotidæ* are remarkable for the position of the anus, which is so very far forward as in the electrical eel to be before the gill-openings, while in some of the other fishes of this family it is even before the eyes. Some fishes of this family have an elongated snout. The electrical eel, however, has a rounder and more obtuse nose than the common eel.

GYNÆCEUM, *jîn-ê'sê-ŭm*: in Greek and Roman antiquity, the part of the house reserved for the use or the employments of women; usually an apartment remote from the entrance and beyond the interior court: also a manufactory managed by women, in which the imperial family's clothing and furniture were made. In botany, the pistil.

GYNANDRIAN, a. *jîn-ăn'drî-ăn* [Gr. *gŭnê*, a female; *andra*, a male]: in bot., applied to those plants—the GYNANDRIA, *-drî-ă*—which have the stamens adhering to the pistil, as in orchids; also GYNANDROUS, a. *-drŭs*.

GYNANDROPHORE, n. *jîn-ăn'drô-fôr* [Gr. *gŭnê*, a female; *andra*, a male; *phêrêō*, I bear]: in bot., a column bearing stamens and pistils.

GYNANTHEROUS, a. *jîn-ăn'thêr-ŭs* [Gr. *gŭnê*, a female; *anthêros*, flowery, blooming—from *anthos*, a flower]: an abnormal condition of the flower in which the stamens are converted into pistils.

GYNARCHY, n. *gîn'âr-kî* [Gr. *gŭnê*, a woman; *archê*, government]: government by a female. GYNÆCOC'RACY, n. *-ê-kôk'ră-sî*, or GYN'EOC'RACY, n. *-ê-ôk'ră-sî* [Gr. *kratos*,

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strength, authority]: female ascendancy or government; a government over which a female may preside.

GYNECOLOGY, or **GYNÆKOLOGY**, or **GYNÆCOLOGY**, *n.* *jīn'ē-kōl ō-jī* [Gr. *gūnē*, a woman, *gunai kos*, of a woman; *logos*, discourse]: the science which investigates the nature of the generative powers of women, and their diseases.

GYNE'RIUM: see **PAMPAS GRASS**.

GYNIZUS, *a.* *jīn-ī'zūs* [Gr. *gūnē*, a woman]: in *bot.*, applied to the position of the stigma on the column of orchids.

GYNOBASE, *n.* *jīn'ō-bās* [Gr. *gūnē*, a woman; *bāsīs*, a base]: a fleshy substance in the centre of a flower, to the base of which the carpels are attached. **GYN'OBA SIC**, *a.* *-bā'zīk*, having a gynobase; applied to a style springing from between the carpels as in *Labiātæ*.

GYNŒCIUM, *n.* *jīn-ē'zhī-ūm* [Gr. *gūnē*, a woman; *oikos*, a house]: the female organs of the flower; the pistils. **GYNŒ'CIA**, *n. plu.* *-ē'sī-ā*, female organs.

GYNOPHORE, *n.* *jīn'ō-fōr* [Gr. *gūnē*, a female; *phorēō*, I bear]: in *bot.*, a stalk supporting the ovary; in *zool.*, the generative buds or gonophores of hydrozoa containing ova alone, and differing in form from those which contain spermatozoa.

GYNOSTEGIUM, *n.* *jīn'ō-stē'jī-ūm* [Gr. *gūnē*, a female, a pistil; *stegō*, I cover]: the staminal crown of *Asclēpiās*, a genus of plants.

GYNOSTEMIUM, *n.* *jīn'ō-stē'mī-ūm* [Gr. *gūnē*, a female, a pistil; *stēmōn*, a thread, a stamen]: a column in orchids bearing the organs of reproduction; the united stamens and pistil of orchids.

GYOMA, *dyō'mōh*: town of Hungary, county of Bekes, 89 m. s. e. by e. from Pesth; on the railway between Pesth and Temeswar. It stands in a plain on the bank of the Körös, here crossed by a bridge. There is a Prot. church. Pop. (1880) 10,160.

GYÖNGYÖS, *dyōn-dyōsh'*: town of Hungary, county of Heves, at the s. base of the Matra Mountains, about 50 m. n. e. of Pesth. The last declivities of the Matra Mountains produce an excellent red wine called by the Germans Erlauer, and very like Burgundy, for which, indeed, it is often mistaken. G. has a gymnasium, manufactures woolen fabrics, and carries on trade in wine and fruit. Pop. (1880) 16,061.

GYP, *n.* *jīp* [Gr. *gups*, a vulture: Scot. *gype*, greedy, voracious]: in *familiar language* at Cambridge University, a man-servant of undergraduates and others. *Note.*—So named from their supposed dishonesty and rapacity; also said to be a corruption of *gypsy-Joe*: at Oxford similar servants are called *scouts*.

GYPAË'TOS: see **LÄMMERGEIER**.

GYP'SIES: see **GYPSY**.

GYPSUM, *n.* *jīp'sūm* [L. *gypsum*; Gr. *gypsos*, white lime] a soft chalky stone which, calcined and burnt, and

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reduced to powder, is called *plaster-of-Paris*; sulphate of lime or calcic sulphate. GYPSEOUS, a. *-sè-us*, or GYPSINE, or GYPSIN, a. *jip sin*, consisting of or resembling gypsum. GYPSIFEROUS, a. *-sifer-us* [L. *fero*, I bear]: containing gypsum.

GYPSUM: mineral consisting essentially of sulphate of lime and water, the proportions being lime, 32.56; sulphuric acid, 46.51; water, 20.93. It is very widely diffused, occurs in great abundance in many parts of the world, and is found in rocks and strata geologically very different, as in transition rocks, in secondary and in tertiary formations. It occurs often in nests or kidney-shaped masses in clay or marl. It is found above chalk in many places, and large quantities are quarried in parts of England from the red marl immediately above the great bed of rock-salt. It occurs in beds sometimes many feet thick. It is transparent or opaque, white, yellowish-white or gray, or even yellow, red, brown, or black, according to its purity of chemical composition or the quantity and nature of impurities present. It is also compact, fibrous, foliated, or earthy; sometimes crystallized in six-sided prisms or in lenses. Twin crystals are frequent. It is easily broken, scratched, and cut. Before the blow-pipe, it becomes opaque, if not already so, and fuses into a white enamel. The water which it contains is driven off by a heat of about 272° F., and it is then easily reduced to powder, in which state it is well known as *Plaster of Paris*. Unburned G. is tough, and not easily reduced to powder. G. is soluble in cold water, to the extent of about one part in 461, and is a frequent ingredient in the water of springs; it is scarcely more soluble in boiling water or in acids. G., as a fertilizer, sometimes proves very useful, but its action is uncertain, and its value for any given locality can be determined only by experiment. On some fields it gives marked and immediate results; while on others, close by and apparently in the same condition, it produces no appreciable effect. G. supplies lime and sulphuric acid to plants; but a large proportion of soils contain these elements in sufficient quantities for most of the ordinary crops. Its principal value is probably in its power of absorbing and retaining ammonia, forming a salt not volatile but readily soluble, which, by the action of rain, is carried to the roots of plants. It is sometimes very efficient when applied to worn soils, but if used without manure, will be a permanent injury to the land. On such soils it acts principally as a stimulant, setting free the small quantities of potash and phosphoric acid which they contain and leaving them utterly exhausted. When sprinkled over the manure heap, G. prevents the escape of ammonia, and also acts as a disinfectant. It should be scattered in stables in warm weather; and it is especially valuable for sowing on stable manure which has been spread on grass land. It is sometimes beneficial to grass when used alone. G. usually gives better results in wet seasons than in dry, and frequently proves more efficient in partially shaded situations than in those which are exposed fully to the sun. It is often used,

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either alone or mixed with ashes, as a fertilizer in the hills for potatoes and corn. It is also sprinkled upon the plants at the second hoeing. On some soils G. is valuable for clover and for grain. It may be sown before or after the seed has been harrowed into the ground. It is often used on the young plants of the cucumber and squash, serving the double purpose of a fertilizer and a protection against destructive insects. It should be sprinkled over the leaves when they are wet with dew. The quantity to be applied to grass land, pastures, and grain fields, is from 100 to 200 lbs. per acre, scattered broadcast. If used in hills or drills, it should be mixed with earth, or else kept from contact with the seed.—G. deprived of its water by burning, and reduced to powder, forms a paste which almost immediately *sets*, or becomes firm and solid, when mixed with its own bulk of water; hence the great use of *Plaster of Paris* for making casts and cornices. But if the G. is burned at too great a heat, it refuses to set, and the powder of the mineral called *Anhydrite*, which is an anhydrous sulphate of lime, has not the property of setting.—One of the finest varieties of uncrystallized and untransparent G. is alabaster (q.v.).—*Satin Spar* is a beautiful fibrous variety of G., exhibiting a fine play of light, and employed for necklaces, inlaid work, and other ornamental purposes, but having the disadvantage of being easily scratched.

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GYPSY, n., spelt also **GIPSY** and **GYPSEY**, n. *jip'si* [a corruption of *Egyptian*]: wandering race of people found in almost every European country, supposed to have come from central Asia, and in some cases through Egypt: name of slight reproach to a young woman. **GYPSIES**, n. plu. *-siz*. **GYPSY**, a. pertaining to or resembling the gypsies. **GYPSYING**, imp. behaving or living like a gypsy. **GYPSYISM**, n. arts or practices of gypsies; cheating. **GYPSOLOGIST**, n. one who studies or has knowledge concerning the gypsies. **GYPSOLOGY**, n. knowledge or investigation concerning the gypsies.

GYPSIES [Fr. *Bohémiens*; Germ. *Zigeuner*; Dutch *Heathens*; Dan. and Swed. *Tatars*; Ital. *Zingani*; Span. *Gitanos*, *Zincali*; Hung. *Czizányok*, *Pharaonepek*; Pers. *Sisech*; Hindu, *Karachee*; Arab. *Harami*; Gyps. *Rom* (man), *Sinto* (from Ind), *Calo* (black): nicknamed in Fr. *Cagoux*, *Geux*; Germ. *Zieh-Gauner*, etc.]: mysterious vagabond race, scattered over the whole of Europe and parts of Asia and Africa, and seen sometimes in small numbers in America. Whence they originally came, and what were the motives which drove them from their native soil, are questions which, after having passed through a long stage of helplessly absurd speculation, have of late years been dealt with by competent investigators, both linguists and historians, but are still only partially solved. So much only seems now established, that India, cradle of many nations, was the source from which they also sprang. Whether, however, they are the Tshandalas of which the laws of Menou speak, or the kinsmen of the Bazeegars or Nuts of Calcutta; whether they belong to the Tshingani, a band of robbers near the mouth of the Indus, or are the descendants of those Lurs—identical, according to Persian and Arabic authorities, with the Zuts or Djatts of n. India—whom Firdusi mentions as having been called into Persia by Bahram Gur to the number of 10,000, about A.D. 420, that they might act as musicians to the poor—cannot be affirmed with certainty, though there can be no doubt that theirs must have been at all times one of the poorest and most obscure tribes of India. The first considerable body left Asia for Europe before the 12th c., perhaps in consequence of disastrous encounters with the Arabian conquerors; and Tamerlane was unquestionably the cause of still more numerous emigrations in the 14th c. The first notice of them in European literature is embodied in a free paraphrase, in German, of the Book of Genesis, written by an Austrian monk about 1122. They are there described as 'Ishmaelites* and braziers, who go peddling through the wide world, having neither house nor home, cheating the people with their tricks, and deceiving mankind, but not openly.' Two hundred years later, we find them settled in Hungary

* Ishmaelites—a notion perpetuated in the designation *Geschmeilim* of the Danish thieves' jargon, and the German *Rothwälsch* (Dorph. 44 and 45; Grolman, 65)—a term which has hitherto puzzled all investigators. Pott himself not excepted (cf. p. 28; Heister, p. 8), but which is nothing but a corruption of the Hebrew *Jishmā'elim*—Ishmaelites.

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(under Betus II.), at Cyprus, and in Wallachia. In 1417, they travelled in great hordes into Moldavia and many parts of Germany. In 1418, five months after the Council of Constance, they appeared, about 1,000 strong, before Zürich, commanded by a Duke Michael 'of Little Egypt,' accompanied by several dukes and knights, and carrying with them a good supply of money, sporting-dogs, and other 'marks of nobility.' From Switzerland they descended into Italy, and 1422 they showed themselves at Bologna and Forli. Another band, numbering, this time, according to the old Swiss historian, Stumpf, 14,000, arrived in the same year at Basel. 1427, Aug. 17, a band of them, coming from Bohemia, made their appearance before Paris, which, however, they were not allowed to enter, but were lodged at La Chapelle Saint Denis. Other hordes succeeded these in the following years, spreading in rapid succession over parts of Germany, over Spain, England, Russia, Scandinavia, and, indeed, over the remotest parts of Europe. The account which they most frequently gave of themselves was, that they originally came from 'Little Egypt;' that the king of Hungary had compelled about 4,000 of them to be baptized, had slain the remainder, and had condemned the baptized to seven years' wandering. Another version of their story was, that the Saracens had gone to war with them in Egypt, had subdued them, and forced them to renounce Christianity; that, after some years, they had been reconquered by the Christians, and that the pope, Martin V, had laid upon them, as a penance for their renunciation of the true faith, a life of wandering for the space of seven years, during which they were not to sleep in a bed. At the end of this period, they would be sent to a fine and fertile land. Yet another account was, that they were commanded by God to roam through the world for that period, in expiation of their want of hospitality toward Joseph and the Virgin Mary—a notion which has, curiously, been partially revived in our own day by Roberts, with this difference only, that he attempts to prove them, from the prophecies of Isaiah, Jeremiah, and Ezekiel, to be the descendants of the ancient Egyptians, and their wanderings the predicted punishment of the various iniquities of their forefathers.

At first they were well received. The romance with which they surrounded themselves, their pretended state of penitence, above all, the pomp and wealth that they displayed, were sufficient to secure the good-will of the countries through which they passed—so much so, that letters of safe-conduct were given them by Emperor Sigismund, the genuineness of which there is no reason to doubt. Soon, however, the tide began to turn. Their resources gone, they were everywhere treated with contumely, and despised chiefly for the degrading arts of chiromancy, magic, and thieving, to which they again resorted for their support, like their earlier brethren, described by the monk. And with the reckless brutality characteristic of the middle ages, edict after edict was hurled against these 'diviners and wicked heathens.' The governments of Europe vied with

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each other in banishing, outlawing, and slaying them whenever and wherever found, and in most severely punishing those that dared to shelter them, chiefly 'because of their traffic with the devil.' These edicts remained in force in many countries down to the 18th c.; and Frederick the Great, 1748. renewed the law that every Gypsy beyond the age of 18, found in his states, should be hanged forthwith. In England, the most barbarous decrees against them were issued by Henry VIII. 1531 and Elizabeth 1563. In Scotland, where under James V., a certain Johnny Faa had been officially recognized by the crown as Lord and Count of Little Egypt, some of the severest edicts date from 1570, 1603, and 1609; and in 1624, Helen Faa, a descendant of Johnny, together with 15 other women of the seed-royal, were condemned to be drowned. Toward the latter half of last century, however, more humane measures were adopted toward them, with a view to the improvement of their social and moral state. Maria Theresa, 1768 and 73, issued ordinances for the education of their children, and their gradual settlement as cultivators of the soil, chiefly in Hungary and Transylvania, where they swarmed in large numbers; special streets were built for them at the ends of the villages, and the name of Uj-Magyar, Uj-Parasztok (New Peasants), was officially bestowed upon them. Joseph II. renewed these edicts 1782. with certain modifications. Various other methods of gradually amalgamating them with the general population were tried elsewhere (a society was formed for that purpose at Southampton, England, by the Rev. Mr. Crabb 1832), but with comparatively little effect. They have continued—with few exceptions—their peculiar nomad life, with all its questionable resources and practices, its joys and its sorrows, unchanged, up to this day; and even gypsy children, brought up far from their tribe, in the midst of Christian families have yielded to some mysterious and uncontrollable impulse, and have run away from their civilized homes as soon as a favorable opportunity offered.

The opinions concerning them, held by the learned since the 15th c. have been very various. They have been then by turns set down as Egyptians, Nubians, Tartars, Cilicians, Mesopotamians, Assyrians, Ethiopians, Moors, Armenians, Manichæans, Banditti, and German Jews. More recently, on account of the name of Zingari or Zingani—probably a corruption from their own name Sinte (from Ind), by which they are known in many countries of Europe, they were brought in connection with the Sigynai, a people of Median origin, settled on the Danube, mentioned by Herodotus; with the Sigynni of Strabo, in the Caucasus; with the Usbecks, and a host of other tribes known and unknown. Again their name has been derived from one Zinganeus, who, 1517, when they had long been known as Zingani, fled with his followers to escape the vengeance of Selim. The now recognized theory of their Indian origin, proved incontestably by their language, was first positively advanced by Rüdiger 1782; and in his track followed, with more or less success—collecting, comparing, or arranging

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new and old linguistic materials—Grellmann, Alter, Seetzen, Pottinger, Hoyland, Puchmayer, Ouseley, Danilowicz, Bischoff, Domeny de Rienzi, Gradlunder, Richardson, Bishop Heber, Pott (whose wonderfully exhaustive work on this subject made him the *facile princeps* of gypsologists), and more recently Paspatis, Miklosich, Borow, Leland, Smart, and Crofton. Bataillard wrote on the history of the G. without discussing specially their language.

This their language, then—a daughter of the old Sanskrit—has, besides giving the only real clue to their origin, also shed some rays over the dark period between their first emigration and their appearance in Europe. Originally the distinct mode of speech of a single and special border tribe of n India, it has, during the many wanderings of the race, appropriated words from every country through which they passed; while on the other hand, it lost many of its own words, and still more of its own inherent power and elegance, and much also of its resemblance to its mother and sisters. These adopted foreign words, their respective number, and their more or less corrupted state, point plainly to the gypsies having passed first into Persia, to their having remained there for a considerable time, to their having then wended their way to some Greek country, perhaps Asia Minor (the designations for 7, 8, and 9 being still Greek), and to their descent thence into Hungary, Cyprus, etc.

But their language also (Romany Tschib), though split into different dialects, has also remained almost the only tie which binds the widely-scattered nomad members together. Those of their branches who for centuries have had no intercourse with each other would, though the strange elements in the other's speech would be incomprehensible to them, yet recognize each other at once by certain words and formulas indelibly written in the memory of the whole race. The outward appearance of the gypsies, who have been pronounced by competent writers one of the handsomest races of humanity, varies in some degree according to the climate under which they are born and in which they roam. Their chief characteristics, however, remain everywhere the same: tawny skin; slightly projecting, but agreeably formed cheek-bones; long hair, of the color and lustre of coal; large black eyes, exquisitely shaped mouths, ruddy lips, teeth of dazzling whiteness, slenderness, and agility of limb, expressive features, and well-proportioned, often elegant build. Their women are, indeed, exquisitely beautiful when young, but they lose their good looks at a very early period, partly through the squalor of their habits, and partly through their unsettled and precarious life. Like children they are fond of showy colors in dress, and do not disdain to adorn themselves with even dubious trinkets and fine garments in a forward state of decay; but they always arrange their clothes, however poor, with great taste. Superstition gave them credit for intercourse with demons. It has been usual for strangers to them to believe and allege all manner of evil as to their character; to say that they are cowardly, revengeful, and treacherous; that they allow themselves to be used as spies; are the associates

GYPSY.

of robbers and thieves; and that their women, chaste themselves, ply all sorts of questionable trades. But those who know them well affirm that their chief faults are vanity, cunning unscrupulously exercised for professional purposes, laziness, violent temper, and recklessness in their resentment, though they are swift to forgive. In their character good and evil are strangely mixed. They are irrepressibly light-hearted and gay, and singularly courteous; keen in their notions of honor, and full of tender family affection. They are free-handed to poor friends. Certain it is, however, that their ethical code differs essentially from that of other people (Gorgio), whom they despise for their childish credulity and brutal cruelty. They have proved themselves, on several occasions, bold and courageous as lions, but they prefer running away to fighting the battles of the foreigners, and it is also agreed on all hands, that they are passionately attached to their relations; that they are fatalists, and have a sort of fetichism or pantheism, though its peculiar form has never been revealed by them to any inquisitive tourist. At the same time they belong outwardly to the religion of every country which they happen to inhabit, and repeat the process of baptism as often as they can, with a view, as some have it, to the presents of god-fathers and godmothers. They believe in a metempsychosis or transmigration of souls, and refrain for that reason from eating certain animals (eels, etc.), though, generally, they are anything but choice in their food. They are dirty, lazy, and fond of drinking, and are great smokers. Their talent for music is remarkable in the extreme; their ears seize, and their instruments reproduce, after the first hearing, the most difficult and complicated pieces, even entire symphonies. Many famous artists (Keeskemeetz, Bunks, etc.) have issued from their ranks; and their own melodies sounding over the wide Hungarian pushtas; the steppes of Russia, or through the streets of Jassy, are not easily forgotten. Some of these melodies have indeed become the much valued property of other nations, or are embodied in some favorite operas. No less wonderful is the grace and charm of their wild dances. Altogether, the gypsies are one of the most gifted races, the lost geniuses, so to say, of humanity. The truth about them, their traditions, and religion, will, we fear, be ever kept a secret. The statement of George Borrow, who lived so long among them, that their entire catechism is summed up in the three precepts: 'Be true to your people—be faithful to your husbands—and never pay any debts except those owing to your own kindred,' must, we fear, be received with the same degree of caution which, we are sorry to say, has to be applied to many other statements about their manners and customs contained in his otherwise useful *Gypsies in Spain*. The incredibly absurd descriptions of the Jewish marriage-ceremonies, about which we do possess the fullest and most authoritative information, given there as a counterpart to those of the gypsies, show plainly how easily and abundantly Borrow's good natured credulity must have been worked upon.

GYPSY-WORT—GYRACANTHUS.

The increase in population, and the growth of culture all over Europe, are their chief antagonists. Their forests are cut down, their heaths inclosed, the houses are pushed right into their commons; and the easy and remunerative belief in their secret arts is waning more and more. It is doubtful, indeed, whether they will, as a separate race, survive many more centuries in Europe. Their numbers at this moment are stated so very differently, that the reader is to be cautioned against an implicit belief in the following figures, from the comparatively most reliable authorities: Hungary (1889) 80,000; Bosnia and Herzegovina (1874) 9,537; Servia (1884) 30,066; Roumania (1889) 200,000; Bulgaria and E. Roumelia (1888) 50,291; vilayet of Adrianople (1876) 27,326 males; Russia (1877) 11,654; Prussia (1887) 1,054 settled gypsies; estimated in Europe (1889) 700,000. Asia and Africa have untold thousands of these nomads. They are found also in N. and S. America, and even in New Zealand and Australia. A small portion only of gypsies occupies as a body fixed habitations in Hungary and Transylvania, where they are agriculturists and goldwashers; and in the Principalities, where they live in a kind of serfdom, and are divided into four different classes—Rudari or Aurari (gold seekers), Ursari (bear-leaders), Lingurari (manufacturers of and dealers in wooden spoons, mouse-traps, etc.); and Laïessi (masons, smiths, tinkers, etc.). All the rest lead a roaming life, live in kennels and under tents from one end of the year to the other, gaining their scanty livelihood, like their forefathers, as best they can, fearing and detesting nothing so much as a fixed and continuous occupation, which would take them away from 'their free mountains, their plains and woods, the sun, the stars, and the winds.'

The following is a specimen of their language in the form of a short improvised stanza:

Poraquel luchi-pen abajo
Abillela un ba lichoró,
Abillela á goli goli,
Ustilame Caloró.

There runs a swine down yonder hill
As fast as e'er he can,
And as he runs, he crieth still:
'Come steal me, gypsy man.'

GYPSY-WORT (*Lycopus Europæus*): perennial plant of nat. ord. *Labiatae*, with stem about two ft. high; opposite, ovato-lanceolate: scarcely stalked, almost pinnatifid, wrinkled leaves; and dense whorls of small whitish flowers with purple dots, the limb of the corolla 4-cleft and nearly equal; only two stamens perfect. It grows in ditches and wet places, on the continent of Europe. It is a febrifuge. The juice stains cloth a permanent black color, and gypsies are said to use it to give a dark hue to their skin, whence the English name gypsy-wort and the French *Herbe des Bohémiens*.

GYRACANTHUS, n. *jí-rá-kán'thūs* [*L. gyrus*; Gr. *gyros*, a circle; *akantha*, a spine]: in *geol.*, a genus of gigantic fin-spines of the Carboniferous formation, the groovings on which run in a spiral manner from the base upward.

GYRATE—GYRINUS.

GYRATE, a. *jī'rāt* [L. *gyrus*; Gr. *gyros*, a circuit or compass, a circle]: winding or going round, as in a circle: V. to whirl round; to revolve round a central point. **GY'RATING**, imp. **GY'RATED**, pp. **GY'RAL**, a. *-rāl*, whirling. **GYRA'TION**, n. *-rā'shūn*, a circular motion; a turning or whirling round, **GYRATION**, **CENTRE OF**: see **CENTRE OF GYRATION**. **GY'RATORY**, a. *-ter-ī*, moving or whirling in a circle. **GYRE**, n. *jīr*, a circular motion; a circle described by a moving body. **GYRED**, a. *jīrd*, falling in rings.

GYRENCEPHALA, n. plu. *jī'rēn-sēf'ā-lā* [Gr. *gyrōō*, I curve or bend; *engkeph'ālōs*, the brain]: a section of the mammalia, in which the cerebral hemispheres are abundantly convoluted.

GYR-FALCON, or **JER-FALCON** or **GERFALCON**, n. *jēr-faw'kn* [Ger. *geier*, vulture, hawk], (*Falco gyrfalco*): a species of Falcon (q.v.) of the northern group, of large size, the female, which is the largest, being about two ft. in entire length; the plumage almost brown when the bird is young, but gradually changing to white as it advances



Gyr-falcon (*Falco Islandicus*).

in age, the white margin of each feather encroaching on its brown centre, until aged birds are almost pure white. It inhabits all the very cold northern parts of the world. It was formerly in high esteem for falconry, and was procured at great expense from Iceland and Norway. It is closely related to the Iceland Falcon (*F. Islandus*) and to the Greenland Falcon (*F. Candicans*).

GYRINUS, *jīr-ī'nūs*: Linnæan genus of coleopterous insects, now constituting a family, *Gyrinidæ*, closely allied to *Dytiscidæ*, or Water Beetles (see **DYTISCUS**), but differing in having the antennæ very short, the two fore-legs and stretching forward like arms, the other legs very short and comparatively broad. The eyes are divided by horny pro-

GYRODUS--GYROPHORA.

cesses, so that each of them almost becomes two. The body is oval, as in the *Dytiscidæ*. The *Gyrinidæ* are generally characterized by metallic brilliancy of color. They



Gyrinus natator.

are mostly small. They fly well, swim and dive well, spend the winter in the mud at the bottom of ponds, and in spring and summer may be seen swimming very actively on the surface of the water, ready to dive on the slightest alarm. In diving, they carry down with them a bright bubble of air. They generally swim in little parties, seeming to chase each other in circles, whence their French name *Tourniquets*, and their English name, *Whirligigs*. They feed on smaller aquatic animals, which they seize in their gyrations. They deposit their eggs on the leaves of aquatic plants. Their larvæ are aquatic, having their bodies composed of 13 deeply divided rings, of which three bear the feet, and the rest bear filaments probably serving as organs of respiration. The species *Gyrinus natator* is a smooth shining blackish insect, three lines long.

GYRODUS, n. *jī'rō-dūs* [Gr. *guros*, a circle; *odous*, a tooth]: in *geol.*, a genus of thick-toothed fishes, so termed from their circular grinding teeth. **GYROG'ONITES**, n. plu. *-rōg'ō-nītz* [Gr. *gonos*, seed]: the spiral seed-vessels of plants allied to the chara, and found fossil in the fresh-water tertiaryes.

GYROMA, n. *jī'rō-mă* [Gr. *gurōmă*, a circle—from *gūros*, round]: the annulus or ring around the sporecase of ferns.

GYROMANCY, n. *jī'rō-măn'sī* [Gr. *guros*, a circuit; *manteia*, divination]: method of divination by means of a circle, generally performed in the following manner: the soothsayer described a circle, and marked it all round with letters; then he commenced to walk round the circle, repeating his incantations, and at the places where he stopped the letters were carefully noted, and by the interpretation put upon these letters, the answer of the god was obtained.

GYROPH'ORA: see **TRIPE DE ROCHE**.

GYROSCOPE—GYROSTAT.

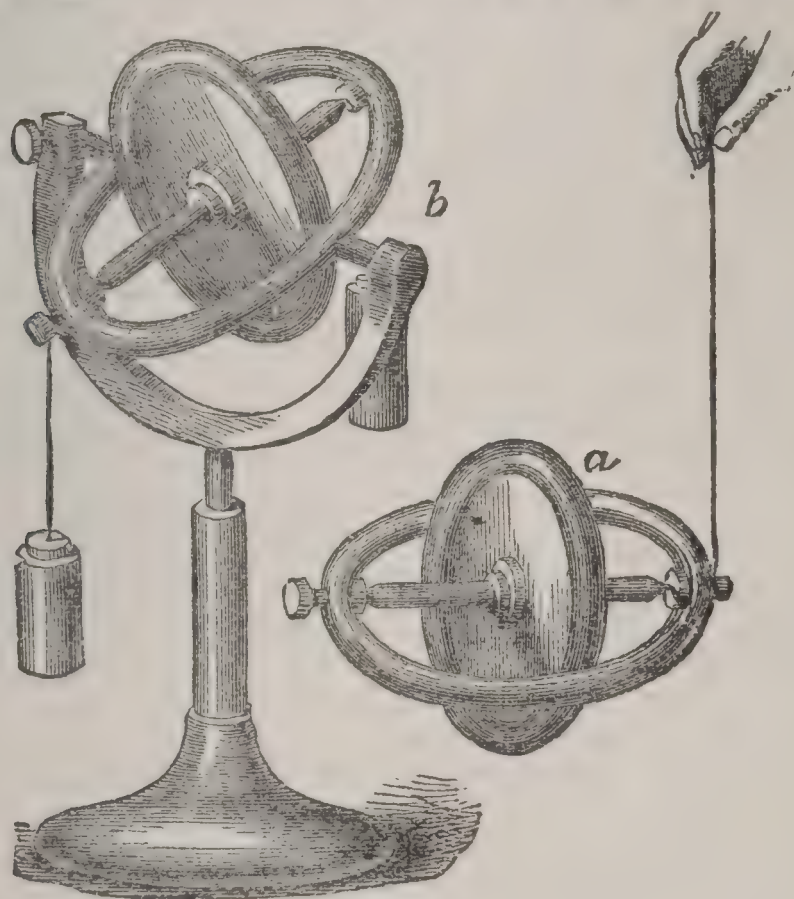
GYROSCOPE, n. *jī'rō-skōp* [Gr. *gyros*, a circuit; *skōpēō*, I see]—**GYROSTAT**, n. *jī'rō-stāt* [Gr. *gyros*, a circuit, *stātōs*, that stands, standing still]: instrument for the exhibition of various properties of rotation and the composition of rotations. It differs from a top in having both ends of its axis supported. The invention is probably French or German, and in some of its forms it dates from about the end of last century; but no certain information can be obtained on these points. Following are two of its many applications.

First, if a mass be set in rotation about its principal axis of inertia of greatest or least moment, it will continue to revolve about it; and, unless extraneous force be applied, the direction of the axis will remain unchanged. Such, for instance, would be the case with the earth, were it not for the disturbances (see **NUTATION** and **PRECESSION**) produced by the sun and moon: the direction of the axis would remain fixed in space (i.e., the pole-star would be always the same star), in spite of the earth's motion in its annual orbit. It is for this very reason that modern artillery is rifled, so that the projectile revolves about its axis. If, then, a mass of metal, as, for instance, a circular disk, loaded at the rim, and revolving in its own plane, be made to rotate rapidly about its axis of greatest moment of inertia, and if it be freely supported (in gimbals, like the box of a compass), the direction of its axis will be the same so long as the rotation lasts. It will therefore constantly point to the same star, and may, of course, be employed to show that the apparent rotation of the stars about the earth is due to a real rotation of the earth itself in the opposite direction. This application was made by Foucault shortly after his celebrated Pendulum (q v.) experiment, and he is generally looked upon as its inventor. The *Transactions of the Royal Scottish Society of Arts*, however, show that this application of the gyroscope was made many years before (1836, Mar.), by E. Sang, c.e. It is, in practice, not perfect a mode of proving the earth's rotation as the Foucault pendulum; but this arises solely from unavoidable defects of workmanship and materials—the mass of the gimbals, and the friction on the pivots. Prof. Smyth, Scottish astronomer-royal, has recently applied this property of the gyroscope to the improvement of our means of making astronomical observations at sea. A telescope, mounted on the same support as the ends of the axis of the gyroscope, will, of course, be almost unaltered in position by the rolling or pitching of a vessel; and a steady horizon, for sextant observations of altitude, is procured by attaching a mirror to the support of the gyroscope, and setting it once for all by means of spirit-level. The mechanical difficulties of construction have not yet been quite overcome but there is little doubt that this application will some day be of very great practical value.

But the most singular phenomena shown by the gyroscope are those depending on the *composition* of rotations. We have already seen (**ROTATION**) that any motion whatever of a body which has one point fixed is of the nature of a

GYROSCOPE—GYROSTAT.

rotation about an axis passing through that point. Hence, simultaneous rotations about any two or more axes, being a motion of some kind, are equivalent to a rotation about a single axis. The effect, then, of impressing upon the frame in which the axis of the gyroscope is suspended a tendency to rotate about some axis, is to give the whole instrument a rotation about an intermediate axis; and this will coincide more nearly with that of the gyroscope itself, as the rate of its rotation is greater. It is hardly possible to explain to the non-mathematical reader the exact nature of the compound motion, which consists in the rolling of an imaginary cone fixed in the gyroscope upon another fixed in space; but the rotation of the axis of a top round the vertical (when it is not 'sleeping' in an upright position), and the precession of the earth's axis, are precisely similar phenomena. Thus, when the gyroscope is spinning, its axis being horizontal, a weight attached to the framework at one end of the axis (fig *b*) makes the whole rotate about the vertical; attached to the other end, the rotation takes place in the opposite direction. And the framework may be lifted by a string attached near one end of the axis (fig. *a*) without



Gyroscope.

the gyroscope's falling. Its axis still projects horizontally from the string, but it revolves as a whole round the string. Various other singular experiments may be made with this apparatus; and others, even more curious, with the gyrostat of W. Thomson (q.v.), which is simply a gyroscope inclosed in a rigid case, by which the ends of its axis are supported. When a gyrostat is made the bob of a pendu-

GYROSE—GYVES.

lum under certain conditions, the plane of vibration of the pendulum turns, as in Foucault's celebrated experiment, but in general at a much greater rate.

GYROSE, a. *jī-rōs'* [Gr. *gyros*, a circle]: in *bot.*, turned round like a crook; marked with wavy lines.

GYROVAGI: class of monks in w. Europe in the early days of monasticism; so named from their wandering or circulating habits. The manner of life and work prescribed by St. Anthony for the inmates of the monasteries led to many humane and useful results. But as the number of communities increased, all manner of excesses sprang up among the inmates; and various bands were formed whose members forsook the monastic institutions and discipline, and sought independent existence. These had no fixed habitation. They wandered from one cell, hermitage, or abbey to another, begging food and shelter from their more rigorous brethren, bringing great scandal to the conscientious devotees, and often creating public trouble. Among these bands were the *euchites*, professing the observance of continual mental prayer; *enthusiasts*, pretending to hold spiritual communications; *choreutes*, practitioners of mystical dancing; and *circumcelliones*, rambling 'seekers after the crown of martyrdom' by means of pillage, arson, and murder. All were classed as Gyrovagi. Augustine and Cassianus wrote against them, Columbanus condemned the degeneracy that they had caused, several synods in Gaul tried in vain to suppress them, and it was only when Benedict had formulated new rules of monasticism in general, and Charlemagne and Louis the Pious rigidly enforced them, that the G. became restrained, and afterward disappeared.

GYULA, *dyo'löh*: town of Hungary, county of Bekes, on the White Körös, which divides it into the German and Hungarian quarters; 30 m. n. of the town of Arad. The trade is chiefly in cattle. Pop. about 19,500.

GYVES, n. plu. *jīrz* [W. *gefyn*, fetters; Gaeł. *germneal*, chain, a fetter]: shackles or iron fetters for the legs. GYVE, v. *jīv*, to fetter; to shackle. GY'VING, imp. GYVED, pp. *jīvd*.

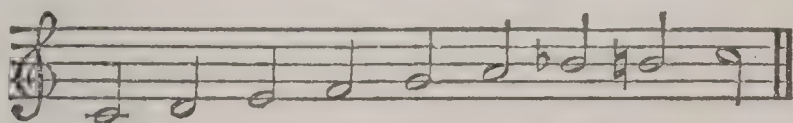
H

H. or **h**, *āch*: a consonant, eighth letter of the English alphabet. It belongs to the order of gutturals, and is a mere attenuation of the sound indicated by the Greek χ and the German (and Scotch) *ch*. The tendency of guttural sounds to become lighter and lighter and at last disappear, is strikingly seen in tracing the history of the letter *h*. The form of the character corresponds to the Phœnician or Hebrew *cheth* (𐤇) and the Greek *eta* (Η, probably at one time pronounced *heta*), which denoted originally the syllable *che*. The Greeks dropped the guttural part of the sound, and took the character to mark the vowel *ē*, while in the Latin alphabet it was taken to mark the (faint aspirated) guttural. That the sound of *h* in Latin must have been faint, is proved by the fact, that many words were written indifferently with or without an *h*; as *honustus* or *onustus*; *aheneus* or *aëneus*. In the languages derived from the Latin, the force of *h* has almost disappeared. It is retained in French as a character, but is scarcely heard in pronunciation. The Italian language altogether ignores the character. In Spanish, it has taken the place in many cases of the Latin *f*, as *hijo* = Lat. *filius*, a son; *humoso* = *fumosus*, smoky.

In the languages of the Gothic stock, *h* often represents the hard guttural sound of *k* or *c*: see letter C. This substitution and the subsequent disappearing of *h*, especially before *r* and *l*, have completely disguised the relationship of many words which are yet of the same root: e.g., Eng. *raw*; Ang.-Sax. *hreaw*; Lat. *eru* or, blood, *eru-dus*, bloody, raw.

The natural tendency in English, as in other tongues, is to attenuate the sound of *h*, and altogether eliminate it. This tendency is strongest among the illiterate, who are unrestrained by the presence of the written character; and accordingly 'to drop one's *h*'s' (e.g., *am* for *ham*) is a sign of the want of education and vulgarity. The perversity of putting *h* where it ought not to be (e.g., *heggs* for *eggs*), is not easily accounted for. These two faults are not common in the United States.

H, in Music, is used by the Germans for the same note which we call **B**, while they call our **B** flat simply **B**; possibly from the flat seventh being more related to **C**, as a fundamental note, than **B** natural, the sharp seventh, is, which they designate **H**. Thus,



C D E F G A B H C

HA! int. *hā* [an imitative word: O. Fris. *haha*, expressing laughter]: a word expressing wonder or surprise; when re-

HAAF—HAARLEM.

peated in rapid succession, it expresses laughter or joyous exultation: N. the interjection so sounded. HA-HA, n. also written HAH-HAH, n. *hâ hâ*, and HAW-HAW, n. *haw-haw*, in *landscape gardening*, a sunk fence, so named as indicating the surprise expressed when the division is first unexpectedly discovered. *Note*.—The form HAW-HAW is said by Skeat to be simply the reduplication of the word *haw* as derived from Icel. *hegi*, a hedged field; Sw. *hage*, an inclosed pasture-ground; Dut. *haag*, a hedge,—thus signifying ‘a hedge or fence’: see HAW 1.

HAAF, a. *háf* [Icel. *haf*; Dan. *hav*, the sea]: pertaining to the deep-sea fishing off the Orkney and Shetland Islands—called the *haaf-fishing*: N. the deep-sea; a deep-sea fishing-bank.

HAARLEM, *hár'lem*: chief town of a dist. of the same name in the prov. of N. Holland; a clean, well-built city, on the shores of the Spaarn, 12 m. w. of Amsterdam, 5 m. from the German Ocean; intersected, like most Dutch towns, with canals and avenues of trees. H. is the seat of govt. for the province, and the see of a Rom. Cath. bishop. Among its 13 churches, the principal is the Great or St. Bavo's Kerk, built in the 15th c., one of the largest in Holland, and specially noted for its lofty tower and famous organ, constructed 1735-38 by Müller of Amsterdam, which, till abt. 1850, was the largest in the world, having 5000 pipes, 64 stops, and four banks of keys; it is still notable for sweetness of tone. Before the church stands a statue of Laurens Coster (q v.), to whom his countrymen ascribe the invention of printing. Among buildings of note are the town hall, with its fine carvings, formerly the residence of the Counts of Holland; the palace of the states-general; the prison; and the Teyler Institution, richly endowed to defend the Christian religion and promote science and the fine arts: it has also a handsome building occupied by 24 poor old women, and has numerous scientific and antiquarian collections. H. has a good gymnasium, numerous academical, scientific, and benevolent institutions, and a national normal school for training teachers. Although no longer celebrated, as in former times, for flourishing trade, it still has extensive refineries of salt, tanneries, foundries for type, various manufactories of silk, linen, and thread, and an extensive trade in flowers, sending its tulips, hyacinths, and other bulbs, to the value in some years of \$200,000, to every part of Europe. H. was a flourishing town as early as the 12th c., when it took an important part in the wars between the Hollanders and the West Frisians. At the close of the 15 c., it lost its privileges, and suffered severely during the revolt of the peasantry; and during the war of independence, it underwent seven months' siege 1572-3, unparalleled in history for the heroism of the citizens. The wood or grove of H. is a great ornament to the city, and a favorite place for recreation. H. has railway communication with Amsterdam, Rotterdam, and the Nieuwe Diep. Pop. (1570) 20,772; (1622) 39,455; (1815) 17,432; (1830) 21,667; (1850) 25,852; (1901) 66,827.

HAARLEM LAKE—HABAKUK.

Nearly one-half of the people are of the Dutch Reformed Church, and about one-third are Roman Catholics.

HAARLEM LAKE, or HARLEMMER MEER, *hār' lēm-mēr mār*, now drained (see POLDER), lay between the towns of Haarlem, Leyden, and Amsterdam, and communicated with the Zuider Zee by 'Het Y.' Before its drainage (1839-52), it embraced the four lakes of Haarlem, Leyden, Spieger, and Helle, which, in consequence of an irruption of the sea in the 16th c., when several villages were destroyed, had merged into one vast sheet of water, and in the course of time encroached so far upon the adjacent land as ultimately to cover more than 60,000 acres. The depth did not exceed 15 ft., more than half of which was composed of mud and clay, from which the Dutch prepared a kind of brick known as 'klinkers,' used for paving. The lake frequently rose during storms to an alarming height, necessitating a large annual outlay in keeping the dams and sluices in repair. In consequence of the damage done to Amsterdam and Leyden by an overflow of the lake 1833, the government entered into an agreement with a company of English engineers to drain it. This undertaking was effected by several gigantic steam-engines, by which the water was pumped up into a canal, formed round the circumference of the lake, and connected with the IJ by various outlets. By these means the waters were drained off, except channels for drainage, and more than 50,000 acres of good land reclaimed, producing large crops of colza, flax, wheat, rye, barley, oats, madder, mustard, and other seeds. The enterprise cost more than \$5,000,000, but the sale of the lands reduced this outlay by nearly \$3,800,000. Pop. (1860) 7,000; (1889) 15,134.

HABAKKUK, *hāb'āk-kūk* or *hā-bāk'kūk*: (Greek forms, *Ambakourm*, *Abacum*, etc.; Latin, *Ambacum*, *Ambacuc*, and *Abacuc*): eighth of the 12 minor prophets of the Old Testament. No account whatever is given in the book itself of the events or the date of his life; but iii. 19, shows him to have been a Levite; and Delitzsch maintains, with probability, that the work was composed shortly after B.C. 650.

In the book, the prophet, first of all, bewailing the general corruption of his people, prophesies the speedy vengeance of God by the hand of the Chaldeans. These, however, shall, when they have fulfilled the divine wrath, perish suddenly themselves, because of their own iniquities; and the prophet gives thanks for this just retribution on the enemies of God's chosen nation. The various chapters have been supposed to have been written under different successive kings (Rosenmüller, Kalminsky, etc.); but the unity of the whole book is so obvious, that this notion has been almost unanimously rejected.

Critics have, in all times: been unanimous in their praise of the style of this prophetic composition. It ranks, indeed, for grandeur and sublimity of conception, for vigor and fervor of expression, for gorgeousness of imagery, for melody of language, among the very first productions of sacred literature. It is especially the peculiar strophic ar-

HABBLE—HABEAS CORPUS.

rangement of chap. ii., with its awful four 'woes' denounced against the Chaldeans, and above all, that matchless 'Pindaric Ode,' as Ewald calls the anthem in chap. iii., which have challenged universal admiration. Daniel Webster declared the imagery of H. unsurpassed in all literature.

HABBLE, *n.* *háb'l*: in *Scot.*, a squabble; a mob-fight; a street row: V. to put into a state of perplexity; to confuse. HABBLING, *imp.* *háb ling*. HABBLED, *pp.* *háb'ld*.

HABEAS CORPUS, *hā-bē-ūs kōr'pūs*, WRIT OF [L. *hā-bēas*, you may have; *corpūs*, the body]: writ directed by courts of law or equity to produce the body of a person who may be probably supposed illegally detained, and to state the reasons of such detention, so that the court may judge of their sufficiency. This writ is one of the chief guards of the liberty of the citizen in Britain and in the United States, and is the envy of foreign nations, being one of the best securities against tyranny ever devised. It is often erroneously supposed that this efficacious protection of personal freedom was bestowed first by the statute of 31 Ch. II. c. 2, called the Habeas Corpus Act. But the true foundation of that act, as well as of many other cardinal principles of the English constitution, is in the Great Charter, or Magna Charta, of which Hallam (1 *Const. Hist.* 16) observes: 'No freeman could be detained in prison except upon a criminal charge on conviction, or for a civil debt. In the former case, it was always in his power to demand of the Court of King's Bench a writ of *habeas corpus ad subjiciendum*, directed to the person detaining him in custody, by which he was enjoined to bring up the body of the prisoner, with the warrant of commitment, that the court might judge of its sufficiency, and remand the party, admit him to bail, or discharge him, according to the nature of the charge. This writ issued of right, and could not be refused by the court.' The Great Charter, as Prof. Creasy sums up this part of its substance, 'contained two great principles. First, that no man shall be imprisoned on mere general grounds of suspicion, or for an indefinite period, at the discretion or caprice of the executive power; but that imprisonment shall be only inflicted as the result of a legal trial and sentence, or for the purpose of keeping in safe custody, when necessary, an accused person on a definite charge, until he can be tried on that charge. Secondly, that, as a general rule, every person accused of a criminal offense shall have the question of his guilt or innocence determined by a free jury of his fellow-countrymen, and not by any nominee of the government.' And Blackstone, with great spirit, thus discourses on the social and political effects of this feature of the British constitution (1 *Bl. Com.* 13): 'Of great importance to the public is the preservation of this personal liberty, for if once it were left in the power of any the highest magistrate to imprison arbitrarily whomever he or his officers thought proper, there would soon be an end of all other rights and immunities. Some have thought that unjust attacks, even upon life or property, at the arbitrary will of the magistrate are

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less dangerous to the commonwealth, than such as are made upon the personal liberty of the subject. To bereave a man of life, or by violence to confiscate his estate without accusation or trial, would be so gross and notorious an act of despotism, as must at once convey the alarm of tyranny throughout the kingdom; but confinement of the person by secretly hurrying him to jail, where his sufferings are unknown or forgotten, is a less public, a less striking, and therefore a more dangerous engine of arbitrary government. And yet, sometimes, when the state is in real danger, even this may be a necessary measure. But the happiness of our constitution is, that it is not left to the executive power to determine when the danger of the state is so great as to render this measure expedient, for it is the parliament only or legislative power that, whenever it sees proper, can authorize the crown, by suspending the *Habeas Corpus* Act for a short and limited time, to imprison suspected persons, without giving any reason for so doing.' The Habeas Corpus Act, passed in 31 Ch. II. c. 2, therefore did not introduce any new principle, but merely defined with greater precision and detail the appropriate remedies, in consequence of the frivolous objections made by the judges of the preceding reign.

The result is, that in all cases whatever in England, and similarly in the United States, where a person, whether man, woman, or child, is presumed to be illegally confined, the remedy is for some friend to appeal for a *habeas corpus*, which, on a good *prima facie* case, will be issued to the person who is so presumed illegally to confine the applicant; and if such person refuses to make a proper return—that is, show good legal grounds for what is done—he will be committed for contempt. If the party is confined under recognized authority, as a child by a parent, these facts must be stated. If the party is confined under some legal authority, then the warrant of commitment must be produced, and the rule is that such warrant must set forth the subject-matter, and the jurisdiction of the judge or justice who so committed the party, so that the legality of the imprisonment may be judged of.

In Scotland the Wrongous Imprisonment Act, 1701, c. 6, which works to the same effect, is often called the Scotch Habeas Corpus Act.

Habeas corpus is the formal commencement also of several other legal writs of kindred nature to that above mentioned; but the above, strictly called the writ of *habeas corpus ad subjiciendum*, is the famous remedy against violation of personal liberty. Thus, *Habeas corpus ad respondendum* is a writ issued by a common law court to bring up a prisoner to serve him with a writ in another action. *Habeas corpus ad satisfaciendum* is a similar writ to take the prisoner in execution for another cause of action. *Habeas corpus ad testificandum* is the writ by which a prisoner is brought up by the jailer to give evidence as a witness in a court of justice.

The constitution of the United States provides (Art. I., sec. 9) that the privilege of the writ of *habeas corpus* shall

HABENDUM—HABERSHAM.

not be suspended unless when, in cases of rebellion or invasion, the public safety may require it; and the same regard for personal liberty is similarly manifested in nearly all the states. Since the adoption of the federal constitution several occasions have arisen when the writ has been suspended; and an interesting line of argument has been drawn by some of the most eminent constitutional lawyers in the country as to whether the suspending power was vested in the pres. or the congress. In 1861 Pres. Lincoln authorized Gen. Scott to suspend the writ under certain contingencies; and Chief Justice Taney issued a writ of H. C. in the case of a citizen in Baltimore who was under arrest by a U. S. officer on a charge of treason, which writ the general to whom it was directed declined to recognize on the ground that the pres. had suspended the privilege. The chief-justice, holding that congress, not the pres., had the sole power to suspend, was supported by Deady and Smalley; while Horace Binney, Reverdy Johnson, and others held opposite views. Congress, however, passed an act (1863, Mar. 3) authorizing the pres. to suspend the writ, and under this act it was suspended by proclamation by the pres. 1871, Oct. 17, and Nov. 10.

HABENDUM, *hā-bĕn'dŭm*, in Law: name of a clause in a deed of grant or lease, in which clause the kind and nature of the estate is described, and it is stated for how long the estate is to be held.

HABERDASHERY, n. *hīb'ēr-dāsh'ēr-ĭ* [Icel *hapurtask*, things of trifling value—from *haprtask*, a haversack, or bag to carry oats or provisions in: Icel *taska*, a chest, a pouch]: originally pedlers' wares as carried in a sack; small-wares, woolen drapery goods, and suchlike. **HAB'ERDASHER**, n. a dealer in soft goods, as woollens, linens, silks, etc. **HABERDASH**, v. *hīb'ēr-dāsh*, in *OE.*, to deal or trade as a haberdasher. **HAB'ERDASHING**, imp. **HAB'ERDASHED**, pp. *-dāsh't*.

HABERDINE, n. *hīb'ēr-dĭn* [F. *habordean*; Dut. *abberduan*]: a kind of cod-fish cured; poor-john. *Note.*—*Poor-john* seems to be a corruption of F. *habordean* by cutting away the first syllable *ha*.

HABERE FACIAS POSSESSIONEM, *hā-bĕr'ĕ fā'sĭ-ās pŏs-sĕs-sĭ-ō'nĕm*, in Law: writ which issues after a successful plaintiff has recovered judgment in an action of ejectment. He then calls on the sheriff, by this writ, to put him in the possession of the land or premises, and the sheriff executes it by breaking open the doors, if necessary, and then delivering over the possession to the plaintiff.

HABERGEON, n. *hāb'ēr-jŭn* [F. *haubergeon*, originally a little coat of mail (see **HAUBERK**)]: a short coat of mail, consisting of a jacket without sleeves, to defend the neck or breast. In early times, the H. was composed of chain-mail; but in the 14th c. a H. of plate-armor was worn over the hauberk: see **HAUBERK**.

HABERSHAM, *hāb'ēr-sham*, **JOSEPH**: 1751, July 28—1815, Nov. 17; b. Savannah: statesman. He was active in pre-revolutionary movements, helped seize the powder in the royal magazine in Savannah for the patriots, was a mem-

HABILIMENT—HABIT.

ber of the Ga. council of safety, commanded a party that arrested Gov. Wright and confined him to his house, became maj. 1st Ga. battalion, defended Savannah against a royal naval attack 1776, Mar.; and was lieut.col. at the close of the war. He was speaker of the state assembly 1785,90, and postmaster-gen. of the United States 1795-1802.

HABILIMENT, n. *hă-bil'î-mënt* [F. *habillement*, clothes—from *habiller*, to dress: L. *habitus*, dress]: a garment; clothing. **HABILIMENTS**, n. plu. garments or dress in general.

HABILITY, n. *hă-bil'î-tî* [L. *habilitas*, ability]: in *OE.*, aptitude; ability.

HABIT, n. *hă-bit* [OF. *habit*, a garment, a raiment: L. *habitum*, state of the body, dress—from *habēō*, I have, I possess: F. *habit*, a suit of clothes]: dress; the particular state of the body; a coat with a long skirt worn by ladies on horseback; the tendency to any action or practice occasioned by custom or frequent repetition; manner; way; in *bot.*, the general external appearance of a plant: V. to dress or array. **HABITING**, imp. **HABITED**, pp. **HABITUAL**, a. *hă-bit ū-ăl* [F. *habituel*: OF. *habitual*]: formed or acquired by habit; customary; usual. **HABITUALLY**, ad. -ly. **HABITUALNESS**, n. **HABITUATE**, v. -ū-āt [mid. L. *habituatus*, brought into a certain condition]: to accustom; to make familiar by frequent use or practice. **HABITUATING**, imp. **HABITUATED**, pp. -ā-tēd. **HABITUATION**, n. -ā-shūn. **HABITUDE**, n. -tūd [F.—L.]: state with regard to something else; long custom. **HABIT-MAKER**, a tailor who makes long cloth riding dresses for ladies. **HABIT-SHIRT**, a thin muslin or lace garment worn over the neck and breast by females. **HABIT AND REPUTE**, in *Scots law*, whatever is generally received as matter of fact; known to be acting or living in a certain way, as, a person may be married by *habit and repute*, and the crime of theft is aggravated by *habit and repute*.—**SYN.** of 'habit, n.': custom; fashion; method; mode; practice; usage; prescription; attire; apparel; array; costume; clothes; clothing; vestment; vesture; habiliment; raiment; garment; guise; garb; temperament; conduct; disposition; character;—of 'habitual': accustomed; common.

HABIT: certain portion of one's acquired powers or aptitudes; involving a tendency to any action or practice, occasioned by custom or frequent repetition. Common usage does not closely define the kind or extent of acquisitions intended by it. Habits may be either intellectual or moral. We speak of a habit of talking or writing, as well as of a habit of early rising, or of truthfulness. The principle of the human constitution on which the growth of habit depends, when generalized to the utmost, may be called the power of *retentiveness*, or of plastic growth, and is one of the foundations of the intellect, inasmuch as memory and all the other intellectual faculties involve it in a greater or less degree: see **INTELLECT: ASSOCIATION OF IDEAS**. Education of every kind must proceed upon this property and should be conducted in conformity with its

HABIT.

exact nature and laws. The maxims that govern the formation of habits are the same as the principles of mental acquirement in every shape. Some of the most important of these are indicated here.

1. It should be understood, at the outset, that all persons are not alike susceptible of the growth of new powers, or of the process of education; nor is the same person equally susceptible as regards all subjects. The consequence is, that a much greater amount of practice is necessary in one case than in another; iteration being the mode of supplying the defective cohesiveness of the system.

2. However common the remark, that youth is the season for improvement, it is doubtful if we generally appreciate to the full degree the superior plasticity of early years, and the gradual decrease of the property as life advances. The as yet unoccupied state of the infant mind must be taken into account with the very great energy of the principle of growth, which gives a firmness and security of hold to early impressions beyond everything communicated in later life. We see this in the impossibility of eradicating a provincial accent after one has grown to maturity; so the opinions and sentiments contracted in youth are seldom changed in middle or advanced life.

3. In acquiring habits, the favorable disposition of the mind is of the greatest importance. Liking, taste, or predilection for the task concentrates all the energies of the system upon the work, and favors to the utmost the cementing process. A strong natural liking will often compensate for want of natural aptitude, by making the most of what power there is.

4. In the default of natural liking for the subject, the attention may be secured to a certain extent by pains and penalties; but as these waste and enfeeble the powers of life altogether, there is a loss on the whole, though there may be a gain in the particular case. The education of the young cannot be conducted wholly on the principle of fascination; but if pain has to be frequently or permanently resorted to, no considerable general progress need be looked for.

5. Health, freshness, and vigor in the bodily system are conditions of the growth of habit. The brain may be powerful in a feeble body, but a certain co-operation of the other organs is necessary to the integrity of its functions; and when the stage of nervous exhaustion has been reached, there is nothing gained by continuing the exercise. After adequate rest and refreshment, the plastic property is at its height; there is a limit to what it can perform, which is marked by the approaching sense of fatigue; and at this point, the efforts in the way of learning should cease. The prevailing error heretofore has been to overrate this limit, and to continue school exercises too long at one time. A short intermission enables the work to be resumed.

6. These observations apply to mental acquisitions generally. In the peculiar case of *moral* acquisitions—such as habits of fortitude, courage, contentment, honest deal-

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ing, obedience—some special considerations are applicable. In the first place, there must be a powerful *initiative*, or some influence strong enough to make a decided commencement, and to keep up the desired conduct for a certain length of time. Either the coercion of some authority, or a powerful example, or an energetic resolution of the individual will, may induce the person to enter on the course prescribed, and to persevere until the plastic process, in other words, the power of habit, has had time to operate. The commencing stimulus may then be gradually withdrawn in favor of the self-sustaining force that iteration has developed.

HABITABLE, a. *hăb' i-ti-bl* [F. *habitable*—from L. *habitābilis*, habitable—from *habitāre*, to have possession of, to inhabit]: that may be dwelt in. **HABITABLENESS**, n. *-bl-nēs*, capacity of being inhabited. **HABITANCY**, n. *-tăn-sĭ*, abode; legal settlement. **HABITAT**, n. *-tăt* [L. *hăbităt*, it inhabits]: dwelling; the natural locality of an animal or plant in its wild state. **HABITATION**, n. *-tĭ shŭn* [F.—L.]: a place of abode; a house; a residence; in the *Roman law*, a servitude by which a person could use a house only as a habitation or dwelling, and for no other purpose. **HABITANCE**, n. *-tăns*, in *OE.*, dwelling; abode.

HABITANT, n. *hăb' i-tănt* [F. *habitant*—from F. *habiter*, to dwell—from L. *habitare*]: in *OE.*, an inhabitant.

HABITAT, **HABITATION**: see under **HABITABLE**.

HABITUAL, **HABITUATE**, **HABITUDE**, etc.: see under **HABIT**.

HABITUE, n. *ă-bē-tŭ-ă'* [F. pp. of *habituere*, to accustom]: one who habitually frequents any place, especially a place of amusement or recreation.

HABLE, a. *hă bl* [L. *hăbilis*, manageable, suitable]: in *OE.*, fit; apt.

HABNAB, ad. *hăb' năb* [AS. *habban*, to have; *nabban* = *ne habban*, not to have]: in *OE.*, hit or miss; at random; by mere chance.

HABROMANIA, n. *hăb-ro mă' nă-a* [Gr. *habros*, pretty, pleasant; *mania*, madness]: form of insanity in which the delusions are pleasant or gay.

HABRONEME, a. *hăb-ro-nēm* [Gr. *habros*, graceful, delicate; *nema*, yarn]: in *mineral.*, having the form of fine threads.

HACHEL, n. *hăch' ěl* [etym. doubtful]: a sloven; a dirty, untidy person.

HACHURE, n. *hăch' ŭr* [F. *hachure*, hatching in engraving—from *hache*, a hatchet]: the shading on maps used to represent mountains, etc.

HACIENDA, n. *hăs' ěn' dă*, or *ă-thē-ěn' dă* [Sp.]: in *Sp. Amer.*, an isolated farmhouse with surrounding land.

HACK, n. *hăk* [Sp. *haca*; OF. *haque*, a pony; F. *haque-née*, an ambling horse: comp. Gael. *each* = *hăc*, a horse]: a horse or carriage kept for hire; a horse kept for all kinds of work, or for ordinary use; any thing or person overworked

HACK—HACKETT.

on hire; a drudge; anything much used: V. to hire as a hack; to rough ride; to treat roughly. HACKNEY, n. *hāk'nī*, HACK'NEYS, n. plu. *nīs*, a horse kept for hire: ADJ. let out for hire; devoted to common use: V. to use much; to use or convey by a hackney. HACK'NEYING, imp. HACK'NEYED, pp. *-nīd*: ADJ. used much or in common; worn. HACKNEY COACH, a carriage exposed for hire. HACKWATCH, in *nav.*, a good watch with a seconds hand, used in taking observations, to obviate the necessity of constantly moving the chronometer. *Note.*—English HACK, a horse, and as a verb 'to rough-ride,' is a mere modern abbreviation of *hackney*, a horse let out on hire, just as *cab* is an abbreviation of *cabriolet*, and *bus* of *omnibus*.

HACK, n. *hāk* [F. *hacher*, to mince—from *hache*, a hatchet: Sw. *hacka*, to chap: Dut. *hacken*, to cut up; *hacke*, a spade: Ger. *hacken*, to chop: Dan. *hakke*, to hack, to mince: comp. Gael. *eag*, a notch]: a notch or cut made by the blow of an instrument; in *OE.*, a hesitation or faltering in speech: V. to cut or chop with repeated strokes; to mangle; to notch; to cough in a short broken manner; in *OE.*, to speak with stuttering or hesitation. HACK'ING, imp. HACKED, pp. *hākt*.

HACK'BERRY: see NETTLE TREE.

HACKBUT, n. *hāk'būt*, or HAGBUT, *häg'būt* [OF. *haquebute*, an arquebus: Dut. *haak*, a hook; *bus*, a gun-barrel]: an old kind of musket, so named from its bent shape; an *arquebus*, which see.

HACKEE, n. *hāk'ē* [etym. doubtful]: name given to the Ground-squirrel (q. v.).

HÄCKEL, ERNEST HEINRICH: see HAECKEL, ERNST HEINRICH.

HACKENSACK, *hāk'en-sāk*: town, cap. of Bergen co., N. J.; on the Hackensack river and the New York Susquehanna and Western, N. J. and New York, New York Ontario and Western, and the New York W. Shore and Buffalo railroads; 8 m. s.e. of Paterson, 12 m. n. of New York. It contains an acad., classical institute, several public and private schools, public library, 9 churches, foundry, iron-works, carriage and jewelry factories, planing and molding-mills, gas and water-works, and numerous fine residences with beautiful surroundings. H. was settled by the Dutch more than 200 years ago, was occupied in turn by the British and American armies during the revolutionary war, and has interesting historical associations. Pop. (1870) 4,920; (1880) 4,248; (1900) 9,443.

HACKERY, n. *hāk'er-ī*: in *Bengal*, a native cart drawn by oxen.

HACKETT, *hāk'et*, JAMES HENRY: 1800, Mar. 15—1871, Dec. 28; b. New York: actor. He received an academical education, studied in Columbia College one year, read law, engaged in commercial business till financially ruined; and made his first appearance on the stage at the Park Theatre, New York, as Justice Woodcock in *Love in a Village*, 1826. He made a specialty of representing

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Yankces, western pioneers, and Frenchmen; and with a ludicrous visage and peculiar drawling speech attained popularity at home, and in England, which he visited 1827, 32, 40, 45, and 51. Later he undertook Shakespearian characters, and as Falstaff was at his best. He managed the American tour of the Grisi and Mario opera troupe 1854, and filled his last public engagement, Boston 1871.

HACKETTSTOWN, *hák'ets-town*: town in Warren co., N. J.; on the Musconetcong river, the Morris and Essex canal, and the Del. Lackawanna and Western railroad; 24 m. e.n.e. of Easton, 52 m. w. by n. of Newark, 63 m. w. of New York. It contains 4 churches, 3 academies, the seminary of the Newark Meth. Epis. conference, 1 national bank (cap. \$150,000), 9 carriage factories, 2 foundries, car-shops, flour and saw-mills, and 2 weekly newspapers. Pop. (1880) 2,502; (1890) 2,417; (1900) 2,474.

HACKLANDER, *hák'lën-dër*, **FRIEDRICH WILHELM**: 1816, Nov. 1—1877, July 6; b. Burtscheid, near Aix-la-chapelle: German poet. After several vicissitudes he began his literary career in Stuttgart, with *Bilder aus dem Soldatenleben im Frieden*, which appeared in the *Morgenblatt*, and has since been translated into several languages. The literary fruits of a journey to the East, on invitation of Baron von Taubenheim, were *Daguerreotypen aufgenommen auf Einer Reise in den Orient* (2 vols., Stuttg. 1842; 2d ed. 1846); and *Pilgerzug nach Mekka*, collection of oriental tales and legends. Later he published *Wachtstuben abenteuer*, *Märchen*, and a variety of smaller works; and afterward *Soldatenleben im Kriege* (2 vols, 1849-50). He published numerous romances: *Handel und Wandel* (1850), *Eugen Stillfried* (1852), *Namenlose Geschichten* (1851), etc. H. has been styled the German Dickens. His comedy, *Geheimer Agent* has been performed on all the stages of Germany, and translated into Hungarian, Polish, and English. Other of his works are *Ein Winter in Spanien* (1855); *Der neue Don Quixote* (1858); *Künstlerroman* (1866), *Zwölf Zettel* (1867); *Das Geheimniß der Stadt* (1868); the play *Die Marionetten* (1868); *Kainszeichen* (1874).

HACKLE, n. *hák'l*, or **HECKLE**, n. *hëk'l* [Dut. *hekel*, a hackle—from *haak*, a hook: Ger. *heckel*—from *haken*, a hook: Fin. *hakyla*, a hackle, a comb: Sw. *hackla*—from *hake*, a hook]: an iron-spiked comb or machine for dressing flax, raw silk, or any flimsy substance (see Heckle); a fly for angling, dressed with feathers or silk: V. to dress flax with a hackle; to tear asunder. **HACK'LING**, imp.: N. act or process of preparing flax by the hackle. **HACKLED**, pp. *hák'ld*. **HACKLER**, n. *hák'l'er*, or **HECKLER**, n. *hëk'l'ër*, one who. **HACK'LY**, a. -*ly*, rough, as if hacked; covered with sharp points. **HACKLES**, n. plu. *hák'lz*, the long shining feathers from the cock's neck, used to make artificial flies.

HACKMATACK, n. *hák'mă-tăk'*: the N. Amer. Indian name, and now the popular name, of the red larch: see **LARCH**.

HACKNEY, *hák'nî*: a parish of England, county of Middlesex; now a suburb of London, 3 m. n.n.e. of St.

HACKNEY COACHMAN—HADDINGTONSHIRE.

Paul's. It was formerly a favorite suburban residence of London citizens, but the current of fashion has for many years been setting to the west. In its fashionable days, it is said to have given its name to hackney-coaches; but see HACK 1.

HACK'NEY COACHMAN: driver of a carriage exposed for hire. Such drivers differ in no respect from other carriers, except that in addition they are generally under police regulations in towns and cities, and a tariff of fares is imposed upon them. They usually are required to have a license from the town-council or other similar body, and must conform to the regulations imposed by this authority.

HACQUETON, n. *hāk'wè-tôn* or *hāk'tôn* [OF. *hauqueton*, or *auqueton*. a cloak, stuff: F. *hoqueton*: Ar. *al-gôton*], in OE., a wadded coat or frock worn under a coat of mail; a wadded coat worn alone as armor of defense.

HAD: pt. and pp. of HAVE, which see.

HADAD, *hād'id*: in the Old Testament, a Syrian deity; primarily according to some authorities the king of the gods, the sun. The Syrian kings in Damascus habitually took the name Benhadad (son of Hadad). *Hadadrimmon* is now supposed to be another name for Adonis or Thammuz, one form of the sun-god.

HADDINGTON, *hād'ing-ton*: market-town and royal and parliamentary borough of Scotland, cap. of the county of H.; at the foot of the Garleton Hills, on both sides of the river Tyne, about 16 m. e. of Edinburgh. The old Abbey Church, a fine Gothic structure in partial ruin, close to the banks of the river, is the most interesting object. John Knox and George Wishart preached in this church. Among principal buildings are the corn exchange, necessarily very commodious, as H. is one of the largest grain-markets in Scotland. The inhabitants are dependent chiefly upon agriculture, but there are nurseries, corn-mills, breweries, tanneries, etc. in the town and vicinity. Pop. about 5,000.

HADDINGTONSHIRE, *hād'ing-ton-shēr*, or **EAST LOTHIAN**, *ēst lō'thī-an*: maritime county in Scotland, n. lat. 55° 4'—56° 5', and w. long. 2° 25'—3° 2'; bounded n. and e. by the Firth of Forth and the German Ocean, s. and s.e. by Berwickshire, and w. by Midlothian; extreme length about 25 m., breadth about 17; 179,142 acres, or 280 sq. m. In the s. of the county are the Lammermuir Hills, height 1,732 ft. In the n. and n.e. is a strip of level ground of unequal breadth, composed of clay and loam, and mostly very productive for all kinds of crops. The climate is excellent on the lower grounds, and the rainfall much under the average. There are few streams of considerable size, the principal being the Tyne, which flows n.e. across the county into the sea at Tynningham. East Lothian has long had high agricultural fame, and has led in introducing improvements in farming. In 1862, Sep., the first steam-plow possessed by a tenant-farmer in Scotland, was introduced into H., at Ferrygate. According to the agricultural statistics (1881), the total number of

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~~acres~~ under rotation of crops was 116,580; in yield per acre H. occupies a very high position, particularly in its crops of oats. Coal and limestone are abundant: the former was wrought in the 13th c., the earliest record in Scotland. H. returns one member to the house of commons. Pop. (1871) 37,771; (1881) 38,502; (1901) 38,665.

Historical interest is confined almost entirely to the battlefield of Dunbar, where Cromwell defeated the Covenanting army 1650; and Prestonpans, where the Pretender defeated the royal troops 1745. Among antiquities are ruins of the Castles of Tantallon, Dirlتون, Luffness, Hailes, and Innerwick. The principal towns are Haddington, Dunbar, and North Berwick.

HADDOCK, n. *hăd'ôk* [OF. *hodot*; Scot. *haddie*: Skeat suggests that HADDOCK may be a mere corruption of AS. *hacod*, a pike, a mullet, in the sense of 'a good fish.'], (*Gadus* or *Morrhua Atglefinus*): fish of the same genus with the cod, and resembling it in general appearance. The number of fins is the same as in the cod, three dorsals and two anals. The H., like the cod, has a barbule at the point of the lower jaw. The H. is brown on the back, silvery on the belly; the lateral line is black, and there is a black spot behind each of the pectorals, these spots sometimes extending to meet on the back. A ridiculous legend ascribes these spots to the finger and thumb of St. Peter, and states the H. to be the fish from the mouth of which he took the tribute-money, 'the inventors of the legend never adverting to the improbability of a marine fish living in the fresh-water lake of Gennesaret.' The H. is not even found in the Mediterranean. Nor does it enter the Baltic, though plentiful in the n. parts of the Atlantic Ocean, both on the European and the American coasts, appearing in great shoals at particular seasons, but in size and quality the haddocks taken at one part of the coast differ much from those of another. Those caught in deep water, are in esteem. It is taken both by trawl-nets and lines. Pieces of the herring and sand-eel are most attractive baits. The H. when really of good quality, is perhaps the finest of all the *Gadidæ*; and the numbers taken on some coasts are very great, rendering it important in an economical view. It does not 'take salt' so well as the cod, but is often cured by drying and smoking. In Mar. and Apr. the H. is out of season; in Oct., Nov., Dec., and Jan., it is in finest condition. Smoked *Finnan Haddocks* or *Haddies* are named from the fishing-village of Finnan or Findon, in Kincardine: they are seen in some American markets.

HADE, n. *hăd*: among *miners*, the steep descent of a shaft; the inclination or deviation from the vertical position of a mineral vein: V. to deviate from the vertical; to slope, as a fault, vein, or lode. **HA'DING**, imp.: N. the amount of deviation from the vertical; the dip in a vein. **HA'DED**, pp.

HADEN—HADES.

HADEN, *hă'dén*, FRANCIS SEYMOUR, M.D.: surgeon and etcher: b. London, 1818, Sep. 16. He was educated at Univ. College and at the Sorbonne, Paris; became a member 1842, and fellow 1857, of the Royal College of Surgeons in England; drew up the International Jury report on surgical instruments, the first public document that recommended ovariotomy; and has been vice-pres. of the London Obstetrical Soc. for many years.—H. is probably best known as an author of numerous art publications and as an accomplished etcher, both lines of work having been undertaken as a relief from the cares of surgical practice and for the purpose of restoring original engraving as it was practiced by the old masters. He has the finest collection of etched work of old masters ever formed, and one of his own plates—*Agamemnon*—brought to his publishers more than \$20,000. His publications, partly literary and partly artistic, have been in progress since 1858. H. visited the United States 1882.

HADERSLEBEN, *há'ders-lā-bén*, or **HADERSLEV**, *há'ders-liv*: town of the German empire, in the n. of the province of Slesvig-Holstein, on the H. Fiord, a narrow arm of the sea, 83 m. n. of Flensburg. The church of St. Mary is a large and handsome edifice. H. has a port for small vessels; and a gymnasium. Pop. (1880) 8,054. H., which formerly belonged to Denmark, received its town rights from Walde-mar II., 1292; and here, 1448, Count Christian of Oldenburg was elected king of Denmark, and began the present dynasty.

HADES, *hā'dēs*, in Greek Mythology: the god of the lower world, commonly spoken of as Pluto (q.v.); thence the name was applied also to his kingdom, the abode of the departed spirits or shades: see GREEK RELIGION: also **HADES** (place of spirits departed).

HADES [Gr. *hādēs*, the unseen]: among the ancients, the abode of the dead; and in modern usage, the place of spirits departed; so named by the Greeks to express their ignorance concerning the state of the soul after death. They at length came to regard it as a miserable and gloomy state allotted to the dead generally, but thought of as divided somewhat indistinctly; the grossly wicked being banished to its lowest darkest region and subjected to perpetual punishment; while those distinguished for heroic deeds were admitted into its brighter portion, the happy Elysian fields. The whole pagan thought of it, however, was vague.—In the Greek translation of the Old Testament *hades* represents the Hebrew *she'ol*, which denotes, first, simply death as calling for all men and carrying them away; then, the state into which the dead are carried, without necessary reference to either the happiness or misery of their lot: yet with most frequent accompaniment of darkness, gloom, and punishment, according to the ignorance and fears of the living, or the guilt of the dead.—In the New Testament the word *hades* derives its chief importance from the Savior's use of it. When, in pronouncing woe on Capernaum, he contrasted *hades* with heaven, perhaps he designed only to set forth figuratively the utter

HADES.

degradation of the city as contrasted with its previous great exaltation. But on another occasion, in promising that the gates of hades should not prevail against his church, he must have had reference to the evil powers of darkness in the unseen world. In the parable of the rich man and Lazarus, representing the former as being, after death, in hades and in torment, Christ plainly taught that a part of the dead were in an unhappy state. After his ascension to heaven he declared that he had the keys of death and of hades; and that both of them should, after the final judgment, be cast into the lake of fire. Whatever be the true interpretation of these last words they imply that in the Savior's mind, hades was associated with evil and consequent misery, as indeed it was plainly so associated in the common mind. Yet we must keep in mind that he used also a stronger word—Gehenna (q.v.)—to denote more distinctly the punishment of the wicked (see HELL).

As to the question, Was Christ himself in hades during the interval between his death and resurrection? some reply: 1. The words from Ps. xvi. 10, which the apostle Peter applied to the risen Lord, 'Thou wilt not leave my soul in hades,' imply that it was there for a time, but was not allowed to continue there. To this it is rejoined that the Greek translation which Peter probably used, and the Hebrew original read, 'Thou wilt not abandon my soul *to* hades' (see Thayer's N. T. Lexicon); that is, 'wilt not allow it to enter there.' 2. It is asserted that the apostle Peter teaches that Christ went to hades, I. Pet. iii. 18-20: 'Christ also suffered for sins once . . . ; being put to death in the flesh, but quickened in the spirit; in which also he went and preached unto the spirits in prison, which aforetime were disobedient, when the long-suffering of God waited in the days of Noah, while the ark was a preparing;' (also iv. 6). But it is replied that the meaning of this passage is conceded to be not clear, and that it has long been in debate among scholars; so that in the lack of other scripture teachings on this subject, there is not foundation sufficient for the doctrine that Christ went into hades. When and where Christ's preaching to 'the spirits in prison' took place is answered differently by interpreters: some, considering that it was after the crucifixion, and in the prison of hades where the spirits then were; while others believe it to have been before the incarnation, in the days of Noah, and to disobedient men then living on the earth, but who, continuing their disobedience, were in the prison of the unseen world when Peter wrote. It may, however, be said that it is not unreasonable nor unscriptural for us to think of Christ, who took his place fully with men, as going after death into that unseen world into which men dying, go. We may thus in general affirm that he went to hades, without affirming a detailed doctrine. 3. The 'apostles' creed' is quoted as teaching that Christ, after his death, 'descended into hades.' This cannot be received as final authority even were this clause proved authentic; moreover, while all the rest of the creed (though not known to be of apos-

HADITH—HADLEY.

olic authorship) can be traced back at least to the 3d c. at Rome, the words, 'He descended into hades,' were not found in the creed even at the opening of the 5th c. An interpolation so late, and, by an unknown hand, may, indeed, convey a truth, but fails to give that truth the authority of an original doctrine of the Christian faith. 4. The only intimations that we have concerning the location of the soul of Christ between his death and his resurrection, were given by himself: first in his assurance to the repenting thief, 'This day shalt thou be *with me in paradise*,' and afterward, in his exclamation to the Father at the moment of death, '*Into thy hands I commend my spirit*.' Neither of these solemn utterances can be held to give a decisive answer to the question in hand. Formerly in the received Greek text and the authorized English version the word *hades* had a place in the apostle Paul's apostrophe, I Cor. xv. 55: 'O death, where is thy sting? O *hades* (grave) where is thy victory?' But in the critical Greek text, and in the revised English version, the passage reads: 'O death, where is thy victory? O death, where is thy sting?'

HADITH, *hād'ith* [Arab. new, a story, legend, tale; emphatically, Hadith Ar-Rassul]: the traditions about Mohammed the Prophet's sayings and doings, which, as complementary to the Koran, form, with it, the supreme authority for all religious and legal questions of the Mohammedans. Originally, it was not allowed to commit them to writing (like the Mishnah, q.v.); but the danger of their being entirely forgotten in the course of time, led to their being written down in the first centuries after Mohammed. Those who, notwithstanding, know them well by heart are honored with the title of Hafiz (retainer, keeper). The six principal sources for these traditions are Ayesbah, after the death of Chadija, the prophet's favorite wife; Abu Hureira, his constant companion and servant; Abdallah Ibn Abbas; Abdallah bnu Omar b. Al-Ass; Djaber b. Abdallah Ansari; and Ans b. Malik. The principal and most authoritative collections of these traditions are those of Bochari, Malik, Abu Dhaud, Tarmesi, Nissai, Moslem, and Sojuti. Of these the most important code is the *Sahih* of Bochari, who, it is said, spent 16 years in collecting such traditions, and who singled out, from a number of 60,000, about 7,270.

HADJ, or preferably **HAJJ** (q.v.), n. *hāj* [Ar. *hadjdj*—from *hadjdja*, to set out, to go on a pilgrimage]: the pilgrimage to Mecca or Medina by a Mohammedan. **HADJI**, n. *hāj'ī*, one who has made the pilgrimage (see **HAJJ**). **NAJA HADJI**, *nā'yā hāj'ī*, the venomous hooded snake of Egypt; the Egyptian cobra.

HADLEY, ARTHUR TWINING: an American educator; b. in New Haven, Conn., 1856, April 23; graduated at Yale Univ., 1876; later studied in the University of Berlin; prof. of political science at Yale Univ., 1866-99; and became its president in the latter year. He is author of *Railroad Transportation, its History and Laws: Economics, an Account of the Relations Between Private Property and Public Welfare, etc.*

HADLEY, *hād'li*, JAMES, LL.D.: 1821, Mar. 30—1872,

HADLEY—HADRAMAUT.

Nov. 14; b. Fairfield, N. J.: philologist. He became hopelessly lame through an accident in his boyhood, and his attention was turned to study. He graduated at Yale College 1842, studied theol. 1843-45, was tutor in Middlebury 1844-5 and Yale College 1845-48, was appointed asst. prof. of Greek in Yale 1848, succeeded Dr. Woolsey as full prof. 1851, and held the chair till his death. His philological attainments were remarkable and gave him a world-wide reputation, as beside a complete mastery of Greek he was well versed in Hebrew, Arabic, Armenian, Sanskrit, Welsh, Gaelic, Irish, Swedish, and the principal modern languages. He was a frequent lecturer on civil law in Yale and Harvard Colleges, member of the American committee for the New Test. revision, a founder of the American Oriental Soc. and its pres. 1870-72, member of the American Philological Assoc., and member of the National Acad. of Sciences. His chief publications were: *A Greek Grammar for Schools and Colleges* (1860); *Elements of the Greek Language* (1869); and posthumously 12 lectures on *Roman Law* (1873) and a posthumous vol., edited by Prof. W. D. Whitney, of 20 *Philological and Critical Essays* (1873).

HADLEY, JOHN: English mathematician: in 1717 made a member of the Royal Soc.; d. 1744, Feb. 15. He was an intimate friend of Newton, from whom, as is now generally supposed, he borrowed the idea of the instrument called Hadley's Quadrant (see **SEXTANT**). The honor of having invented the sextant is claimed for H., for Godfrey, and for Newton; for H., because he was the first to construct the instrument, and give a description of it, which he did 1731, before the Royal Soc.; for Godfrey, because, 1730, he presented a gentleman in Philadelphia with a description of the instrument almost coinciding with H.'s, which description was transmitted to the Royal Soc. 1732; and for Newton, because he, 1727, gave a description of the instrument to his friend Halley, who, for some reason unknown, suppressed it, and it was not till after his death, 1742, that it was discovered. The Royal Soc. decided that Godfrey and H. were both entitled to the honor of the invention, and each received a reward of £200.

HADRAMAUT, *hâ-drâ-mawt'*: district of Arabia, s. and s.e. of the central desert of the peninsula; the Hazar-maveth of Genesis. No systematic survey or exploration of the dist. has been made, and European travellers have given conflicting reports of its geography and physical features. In general it may be said to be bounded on the n. by the great desert, n.e. by Oman, s. by the Arabian Sea, w. by Yemen. Its coast line is variously estimated within 200 m., and its inland stretch within 150 m. The surface is low along the coast, and diversified in the interior with ranges of mountains, deep valleys, and an elevated plateau. The plateau is bisected by the wady Doan, a valley 150 m. long and 35 m. in extreme width, with towns and villages scattered along its entire course. The interior region is very hot, dry, and unhealthful, and the few streams are dry

the greater part of the year. Sheep, goats, camels, horses, dates, indigo, corn, wheat, barley, millet, and cotton are raised by various tribes. The seaport is Makallah, which has considerable trade with India and Yemen.

HADRIAN, *hā'drī-an* (full name PUBLIUS ÆLIUS HADRIANUS), Roman Emperor: A.D. 76, Jan. 24–138, July 10 (reigned 117–138); b Rome. During the reign of Trajan, his guardian, with whom he was connected by marriage (H.'s father, a Roman senator, having married the aunt of Trajan), he filled several high offices in the state. He accompanied the emperor in his wars against Decebalus, where he distinguished himself by bravery; and 117, when Trajan set out on his return to Italy, he was left behind with the army as gov. of the province of Syria. When the intelligence reached Antioch that Trajan had died in Cilicia on his journey home, H. was proclaimed emperor by the army 117, Aug. 11. The state of the empire was extremely critical. Insurrections had broken out in Egypt, Palestine, and Syria; Mœsia in the e., and Mauritania in the w., were invaded by barbarian hordes; while the Parthians had once more asserted their independence, and won several successes over the imperial forces. H., perceiving the advantage of a peaceful policy, wisely resolved to limit the boundaries of the Roman dominion in the e., and concluded a peace with the Parthians, surrendering to them all beyond the Euphrates. In 118, he went to Rome (where he had been acknowledged by the senate), established his authority by liberality toward the people, and suppressed with great severity a patrician conspiracy against his life. The Roxolani (modern Russians), who had made an inroad into Mœsia, were induced to retire by large gifts. In 119, for the purpose of becoming acquainted with the state of the provinces, he commenced his celebrated journey, which he is said to have performed chiefly on foot. He visited Gaul, Germany, Britain (where he built the famous wall extending from the Solway to the Tyne), Spain, Mauritania, Egypt, Asia Minor, and Greece, whence he returned to Rome. 126 or 127, and received the title of *Pater Patriæ*. H. spent the years 132 and 133 in Athens, for which city he had great predilection. After once more visiting Syria, he returned to Italy, and spent the last years of his life at Rome and Tibur. During his last illness at Baïæ, he was subject to violent outbursts of cruelty, to which, as well as to jealousy and pleasure, he was naturally addicted. After the death of Lucius Ceionius Commodus, whom he had adopted under the name of Lucius Ælius Verus, he appointed Titus Aurelius (afterward emperor Antoninus Pius) his successor. During his reign the army was vigorously disciplined and reorganized, so that the barbarians were not likely to attribute H.'s conciliating and peaceful policy to fear or weakness. As a civil ruler, he merits high praise, particularly for the just and comprehensive view he appears to have taken of his duties as a sovereign: hence to him is attributed, more than to any other, the consolidation of the monarchical system of Rome. H. divided Italy into four parts under four con-

HADRIAN—HAECKEL.

suls, to whom was intrusted the administration of justice. H. erected numerous splendid edifices, the chief of which were—the mausoleum called the *Moles Hadriani*, in Rome (groundwork of the modern castle of San Angelo), the Ælian bridge leading to it, and the magnificent villa at Tibur. He likewise laid the foundation of several cities, the most important of which was Adrianopolis. H. was a lover of the fine arts (in the history of which, as well as of jurisprudence, his reign forms an important era), of poetry, philosophy, and rhetoric, all of which he attempted. He set a high value on Greek literature, and likewise on the cultus of Greece, and caused himself to be initiated into the Eleusinian mysteries.

HADRIAN, WALL OF: see ROMAN WALL.

HADROSAURUS, *had-ro-saw'rūs*: genus of gigantic extinct reptiles, classed by Huxley in the order Dinosauria (q.v.). They belonged to mesozoic time, and were the American representatives of the European *guanodon* (q.v.), though somewhat smaller, probably abt. 30 ft. in length.

HADSCH Y: see HASHISH.

HAECKEL, *hæ'k'el*, ERNST HEINRICH: German naturalist: b. Potsdam, 1834, Feb. 16. He studied natural science and medicine at Berlin and at Würzburg under Müller, Kölliker, and Virchow; and soon became distinguished for zeal, originality, and success in zoological studies. He became a docent at Jena 1861, extraordinary prof. 1862, an ordinary prof. 1865, a special chair of zoology being created for him. His lectures, which draw crowds of students to Jena Univ., extend over zoology, general and special, comparative anatomy; histology; embryology; and palæontology. His researches, founded on laborious investigation and collection of specimens, have concerned mainly the lower classes of marine animals. He has visited the North Sea shores, and the Mediterranean; been in Britain, Madeira, Teneriffe, the Canaries, Morocco, Granada; and 1881 sojourned in India and Ceylon, where he worked indefatigably on his favorite subjects, and others cognate. The fruits of his labors have appeared in numerous exhaustive monographs in scientific magazines, like those on the *Siphonophora* (1869), and the *Monera* (1870), as well as in separate works. His first important publication was the magnificent work on the *Radiolaria* (1862), with an atlas of 35 plates; in this work he describes 144 new species besides reorganizing our knowledge of the group. *Die Kalkschwämme* (1866), treatise on the calcareous sponges, a landmark in the science of biology, attempts the analytical solution of the problem as to the nature of species. The *Natürliche Schöpfungsgeschichte* ('Natural History of Creation,' 1866, 6th ed., 1875) is a full statement of the theory of development. *Die Anthropogenie* (1874, 3d ed. 1877; also translated 'The Evolution of Man'), deals with the origin of man; but his most important work is *Die Generelle Morphologie der Organismen* (2 vols. 1866). In these and other popular works and lectures H. appears as a thorough-going supporter of

HÆMA—HÆMASTATICS, HÆMADYNAMICS.

the Darwinian development theory, though differing from Darwin in some details, and in some points extending his method and going beyond him. He has separated a large number of the lower organic forms into a kingdom by themselves, calling them *Protista*, and declining to rank them either as animals or vegetables. He affirms that there is no such thing as well-defined species in the dogmatic sense of the schools; and in such works as that on the *Gastræa* theory (1874), has sought to provide a phylogenetic classification of the animal kingdom, indicating the lines of descent and relationships of the various groups. He was the first outspoken adherent of Darwin in Germany, and has been an enthusiastic advocate of the same theory ever since; pressing it fully and openly from the realm of physical science into an extreme materialism in philosophy. See ZOOLOGY: SPECIES: DARWIN: DARWINIAN THEORY.

HÆMA- (used in compound words) [Gr. *haima*, blood]. Many of these words have the alternative spelling **HEMA-**.

HÆMACHROME, n. *hē'mă-krôm* [Gr. *haima*, blood; *chrōmă*, color]: the coloring matter of the blood.

HÆMADROMOMETER, n. *hē'mă-drō-mōm'ē-tēr* [Gr. *haima*, blood; *dromos*, a course; *metron*, a measure]: an instrument for measuring the velocity of the blood-stream.

HÆMADYNAMOMETER, n. *hē'mă-dīn'ă-mōm'ē-tēr* [Gr. *haima*, blood; *dunāmis*, force; *mētron*, a measure]: instrument devised by Poisseville for determining the pressure of the blood in the arteries and veins of the living body. The pressure is measured, as in the barometer, by the column of mercury that it balances. The instrument has been recently improved in various ways, and a contrivance has been added by which the oscillations of the mercury are inscribed in the form of an undulating curve on a cylinder made to revolve by clock-work; the height of the undulations denoting the *pressure*, and their horizontal amplitude the *time*.

HÆMAGLOBIN: see **HÆMOGLOBIN**.

HÆMAL, a. *hē'măl* [Gr. *haima*, blood]: connected with blood-vessels, or with the circulatory system; applied to the arch under the vertebral column, which incloses and protects the organs of circulation.

HÆMALOPIA, n. *hē-mal-ō'pī-a* [Gr. *haimaleos*, bloody, blood red; *ops*, the eye]: in *pathol.*, an affection of the eye, in which everything appears of a red color.

HÆMAPOIESIS, n. *hē'mă-poy-ē'sīs* [Gr. *haima*, blood; *poiēsis*, the making or forming of a thing]: the production or formation of blood. **HÆMAPOIETIC**, a. *hē'mă-poy-ēt'ik* [Gr. *poiētikos*, making, effecting]: making or producing blood.

HÆMAPOPHYSES, n. *hē'mă-pŏf'ī-sēs* [Gr. *haima*, blood; *apoph'ysis*]: in *anat.*, the parts projecting from a vertebra which form the hæmal arch.

HÆMASTATICS, *hē-ma-stăt'iks* or *hēm-a-*, AND **HÆMADYNAMICS**, *hē-ma-dī-nām'iks* or *hēm-a-*: statics (q.v.)

HÆMATACHOMETER—HÆMATITE.

and dynamics (q.v.) of the blood: see BLOOD: CIRCULATION OF THE BLOOD.

HÆMATACHOMETER, n. *hē'mă-tăk-ôm'ê-tēr* [Gr. *haima*, blood; *tachus*, swift; *metron*, a measure]: an instrument for measuring the velocity of the blood stream, for the same purpose as the hæma-dromometer, but of a different construction.

HÆMATEMESIS, n. *hē'mă-tēm'ê-sīs* [Gr. *haima*, blood, *haimâtos*, of blood; *êmêō*, I vomit]: rejection of blood from the stomach, usually in consequence of some morbid change in its mucous membrane: see STOMACH, DISEASES OF. H. is liable to be mistaken for hæmoptysis (q.v.), unless careful attention is given to the mode in which the blood is ejected. The proper remedies are the liberal use of ice or of ice-cold water; acetate of lead, in doses of two to five grains; tannin, five to ten grains (it must not, however, be given with acetate of lead); oil of turpentine, six to ten drops, repeated every hour or two. The first and the last are perhaps the most effectual means, which can be used in combination. The turpentine may be given beaten up with the white of an egg. It must be discontinued when the symptoms of urinary irritation begin to appear.

HÆMATIN, or **HÆMATINE**, n. *hē'mă-tîn*, or **HÆMATOSINE**, *hē-măt'o-sîn* [Gr. *haima*, blood, *haimâtos*, of blood]: now regarded as a derivative of hæmoglobin, and, as included in that substance, forming the red coloring matter of the blood of the higher animals. In the normal state, it occurs in solution in the interior of the blood corpuscles or cells; but in certain morbid conditions, in which the blood undergoes a species of decomposition, it is deposited in a solid form in the tissues surrounding the smaller vessels through whose walls it has percolated. It can be isolated in only a coagulated form, in which state it has been submitted to analysis by Mulder, who assigned to it the formula $C_{44}H_{22}N_3O_6Fe$. A more recent formula is $C_{34}H_{34}FeN_4O_5$. Its chief peculiarity is that it contains a comparatively large percentage of iron (formerly considered to be about 7 per cent., but recent authorities give it 9 per cent.) It is the only constituent of the body (except the hair) which does contain this metal. **HÆMATOIDIN**, n. *hē'mă-tôy'dîn* [Gr. *eîdos*, resemblance], the blood-crystals found as a pathological production in old extravasations of blood. **HÆMATITIS**, n. *hē'mă-tî'tis*, inflammation of the blood. **HÆMATINURIA**, n. *hē'mă-tî-nû'rî-ă* [Gr. *ouron*, urine], a condition of the urine in which it contains hæmatin.

HÆMATINONE, n. *hē-măt'in-ôn* [Gr. *haimatinos*, bloody]: a red glass known to the ancients, and used for mosaics, ornamental vases, etc.; it is mentioned by Pliny, and occurs frequently in the ruins of Pompeii. Its fine red color, intermediate between red lead and vermilion, is due to red oxide of copper, and is completely destroyed by fusion. H. is opaque, harder than common glass, has a conchoidal fracture, and a sp. gr. of 3.5. It contains no tin and no coloring matter except cupreous oxide.

HÆMATITE, n. *hē'mă-tît* [Gr. *haimatîtis*, resembling

HÆMATOCELE—HÆMATOXYLON.

blood—from *haima*, blood]: a sesquioxide of iron; mineral consisting chiefly of peroxide of iron, occurring often in large quantity; a valuable iron ore: see IRON. There are two principal varieties, *Red H.* and *Brown H.* The red occurs frequently in globular and grape-like masses, with a radiating fibrous structure. It is sometimes of dull reddish-brown, sometimes of a brilliant bluish-gray color; the streak is blood-red. An earthy kind is called *Iron Froth*, and consists almost entirely of peroxide of iron. Brown H. contains about 14 per cent. of water. Its color is generally some shade of brown, sometimes almost black. Different shades of color are often presented in concentric wavy bands. The surface is often covered with a beautiful black varnish, sometimes iridescent. It is frequently found crystallized in rhombohedric, prismatic, or tabular crystals. The primary form is a right rhombic prism.

HÆMATOCELE, n. *hē'mā-tō-sēl* [Gr. *haima*, blood; *kēlē*, a tumor]: tumor filled with blood, as distinguished from hydrocele (q.v.).

HÆMATOCONITE, n. *hē-mā-tōk'on-īt* [prefix *hæmato-*; Gr. *konis*, dust]: in *mineral.*, variety of calcite colored blood-red or brownish red, by red oxide of iron. It is the Rosso Antico of Italy: see ROSO ANTICO.

HÆMATOCRYA, n. *hē'mā-tōk'rī-ā* [Gr. *haima*, blood; *krūs*, cold]: a term applied to the cold-blooded vertebrate animals, as fishes and reptiles. **HÆMATOCRY'AL**, a. *-krī'āl*, cold-blooded.

HÆMATODES, n. *hē-mā-tō'dēz* [Gr. *haimatōdēs*, looking like blood; blood-red]: in *surg.*, a kind of cancer of which the tissue is soft, fungous-like, and ends in hemorrhage.

HÆMATOIDIN: see under **HÆMATIN**.

HÆMATOLOGY, n. *hē'mā-tōl'ō-jī* [Gr. *haima*, blood; *logos*, discourse]: a description of the blood.

HÆMATOMA, n. *hē'mā-tō'mā*, **HÆMATOMATA**, n. plu. *hē'mā-tōm'ā-tū* [Gr. *haima*, blood, *haimātos*, of blood]: a kind of tumor formed from an effused blood-mass resulting from a hemorrhage.

HÆMATOMETRA, n. *hē'mā-tō-mē'trā* [Gr. *haima*, blood, *haimātos*, of blood; *mētra*, womb]: an accumulation of menstrual blood in the uterus, which becomes thick, black, and tarry, and often causes great dilatation.

HÆMATOPUS, n. *hē-mā'tō-pūs* [prefix *hæmato-*; Gr. *pous*, a foot]: in *ornith.*, typical genus of the sub-family *Hæmatopodinae*, oyster-catchers, a sub-family of *Charadriidae* (plovers).

HÆMATOSINE, n. *hē'mā-tō'sīn*: same as *hæmatin* (q.v.).

HÆMATOSIS, n. *hē'mā-tō'sīs* [Gr. *haima*, blood, *haimātōs*, cf blood]: the formation of blood.

HÆMATOTHERMA, n. *hē'mā-tō-thēr'mā* [Gr. *haima*, blood; *thērmos*, warm]: a term applied to the warm-blooded vertebrate animals.

HÆMATOXYLON, n. *hē'mā-tōks'ī-lōn* [Gr. *haima*,

HÆMATOZOA.

blood; *xuton*, wood]: the logwood-tree; the *Hæmātōxylon Campēchiānūm*, Ord. *Legūminōsæ*. HÆ'MATOX'YLIN (or -LINE), n. -līn, the coloring principle of logwood. It is a chromogen (a term used by chemists to denote some nearly or quite colorless substances which, under certain influences, yield well-marked colors) obtained from logwood (*Hæmatoxylon Campeachianum*). Its composition is represented by the formula $C_{16}H_{14}O_6 + 3H_2O$, and in its pure state it occurs in transparent glistening straw-colored prisms. It has a sweet and not astringent taste, is sparingly soluble in cold water, but dissolves readily in boiling water, alcohol, and ether. The watery solution is not affected by the oxygen of the air, but if a very small quantity of ammonia is added, it assumes an intensely reddish purple color.—Hæmatoxylin is obtained by mixing powdered extract of logwood with quartzose sand (to prevent its agglomeration into lumps), and digesting this powder for several days with about six times its volume of ether. The liquid is then distilled till the residue assumes the consistence of a syrup. If this residue is mixed with water, crystals of hæmatoxylin are in a few days deposited, which on an average weigh about one-eighth of the extract that was employed.—The color reactions of this substance with metallic compounds are peculiar, and in consequence of the tinctorial power of some of them, deserve a brief notice. Solution of acetate of lead gives with one of hæmatoxylin a white precipitate, which speedily becomes blue; salts of copper give a dirty green precipitate, which also soon becomes blue; chloride of barium produces a red precipitate; protochloride of tin gives a rose-colored, and iron alum, a scanty blackish precipitate. The purple color which the solution of hæmatoxylin assumes if oxygen and ammonia are present, is due to a decomposition, of which a substance termed *hæmatein* ($C_{16}H_{10}O_6$) is one of the products; the compound resulting from the union of hæmatein and ammonia possessing this tint. The solution of hæmatein-ammonia (or hæmateate of ammonia, as some chemists have termed it) yields colored precipitates with many metallic salts; with acetate of lead, it gives a deep blue, with sulphate of copper, a violet blue, with protochloride of tin, a violet, and with iron alum, a black precipitate. It is upon the various reactions above described that the value of logwood as a dye depends.

HÆMATOZOA, *hē ma-to-zō'a* or *hēm-a-to-zō'a* [Gr. *haima*, blood, and *zōon*, a living creature]: term applied by helminthologists to the entozoa existing in the blood. They occur in mammals, birds, reptiles, fishes, and many invertebrate animals. Some belong to the Nematoidea, others to the Trematoidea, and others to the Protozoa. Most of them are microscopic, devoid of generative organs, and exist in the blood, circulating both in the arteries and in the veins. A very small number attain a considerable size, and are provided with organs of reproduction. These larger ones are generally found in some definite part of the circulating system. Thus, for example, in man the *Distoma hæmatobium* is almost entirely restricted to the

HÆMATURIA.

abdominal venous system; in the horse, the *Sclerostoma aneurysmaticum* to the abdominal arterial system; and in the porpoise, the *Pseudalius filum* to the pulmonary artery and its branches.

Nothing definite is known regarding the origin of these parasites, but certain observations made upon the H. of the frog by Valentin (and subsequently confirmed by Vulpian), lead to the belief, that some of the more minute forms are the larvæ of a worm living in the organs surrounding the vessels. We shall restrict our remarks to the H. occurring in man, the horse, and the dog. By far the most important of human H. is the *Distoma hæmatobium* already mentioned. It has been observed only in Egypt, where it is very common, and where it was found by Griesinger 117 times in 363 autopsies. The male, which is the larger of two, is about $\frac{3}{16}$ ths of an inch in length. The common Liver Fluke (*D. hepaticum*) has, in one instance at least, been found in the interior of the portal vein. In the various cases in which distomata have occurred in tumors, they must have been conveyed to the places in which they were found by the blood.

In 1665, Ruysch discovered a large number of small worms in a dilatation of the mesenteric artery of a horse. Sixty years afterward, a second case was noticed, and it is now known that such cases are of extreme frequency. These verminous aneurisms of the abdominal arteries occur in the ass and in the mule, as well as in the horse. The worm found in them is the *Sclerostoma armatum*, one of the Nematoidea, and often more than an inch in length. It is old horses that are chiefly affected; indeed they scarcely ever seem to escape, for Rayer found these tumors 48 times in the examination of 50 worn-out horses. For much very interesting information on this curious subject, the reader is referred to Rayer's Memoir in the *Archiv. de Médecine comparée* for 1842.

In the dog, H. sufficiently large to be visible to the naked eye are rare. Thirteen such cases are collected by Davaine in his *Traité des Entozoaires*, 1860, the worm generally being a filaria. The microscopic larvæ of a nematoid worm are sometimes found in enormous quantities circulating in the blood of this animal. From the examination of the blood of 480 dogs, Gruby and Delafond believe that 1 in every 20 of these animals presents this peculiarity.

In none of the above cases does the presence of these entozoa appear to effect the general health of the individual in whom they reside, whether he be man, horse, or dog.—For further information on this subject, see Davaine, the standard authorities on Pathological Anatomy and on Parasites: also ENTOZOA: NEMATOIDEA: TREMATODA: ETC.

HÆMATURIA, n. *hē'mă-tŭ'rĭ-ă* [Gr. *haima*, blood; *ouron*, urine]: discharge of blood with the urine, usually from disease of the kidneys or bladder. It is rather a symptom than a disease, and takes its character from the associated morbid conditions of the parts concerned. It is a symptom always of some gravity, but not very often directly fatal. Perhaps the best general remedy is the tinct-

HÆMIN—HÆMORRHAGE.

ure of the muriate of iron, given in water in doses of 20 drops.

HÆMIN, n. *hē'mĭn* [Gr. *haima*, blood]: a crystalline derivative from hæmoglobin, which forms a most delicate medico-legal test of the presence of blood; also called *hydrochlorate of hæmatin*.

HÆMODORACEÆ, *hē-mo-do-rā'sē-ē* or *hēm-o-do-rā'sē-ē*: natural order of endogenous plants, consisting of herbaceous plants with fibrous roots, and sword-shaped leaves; differing from *Iridaceæ* in habit, and in having the stamens six in number, or if only three, opposite to the petals. There are about 50 known species, chiefly natives of N. and S. America, s. Africa, the Mascarene Islands, and New Holland. Some have beautiful flowers. A red color exists in the roots of some: hence the name **BLOOD-ROOT** has been given to them. In this order are ranked the *Vellozias* or Tree Lilies.

HÆMOGLOBIN, n. *hē'mō-glō'bĭn* [Gr. *haima*, blood; L. *glōbūs*, a ball]: a red coloring matter which infiltrates the stroma of the blood-corpuscles, and which may be decomposed into an albuminous substance called *globulin* or *globin*, and a coloring matter called *hæmatin*: also in the same sense **HÆMATOGLOBULIN**, n. *hē'mā-tō-glō'bū-lĭn*.

HÆMOPHILIA, n. *hē'mō-fĭl'ĭ-a* [prefix *hæmo-*; Gr. *philia*, love, affection]: in *pathol.*, hemorrhagic diathesis, characterized by an excessive tendency to spontaneous bleedings of various parts from very slight, inappreciable causes, with excess of red corpuscles, and great diminution of fibrine.

HÆMOPTYSIS, n. *hē-mōp'tĭ-sĭs* [Gr. *haima*, blood; *ptūō*, I spit]: expectoration of blood, a very significant and often dangerous symptom of disease of the lungs or heart; in all cases important, and requiring immediate attention, yet apt to be viewed popularly with somewhat exaggerated alarm. It is seldom directly fatal. It is rather as an indication of dangerous disease, than from its immediate danger, that it requires such careful attention; but unquestionably, it is a matter of common prudence to seek medical advice on the appearance of even the slightest tinge of blood in the expectoration from the lungs. The gravity of this symptom depends very much on its cause. The treatment should not be undertaken without a medical examination; but in case of extremity, it may be desirable to know that repeated doses of ipecacuanha (q.v.), carried up even to the emetic effect, have often been found serviceable.

HÆMORRHAGE, or **HEMORRHAGE**, n. *hēm'ōr-rāj'* [Gr. *haimorrhagĭā*, a flowing of blood—from *haima*, blood; *rhegnūmi*, I burst forth]: a morbid flow of blood from the nose, lungs, or intestines; an infusion of blood into the brain, arising from the rupture of one or more blood-vessels; any bleeding (see **BLEEDING**). **HÆMORRHAGIC**, or **HEMORRHAGIC**, a. *hēm'ōr-rāj'ĭk*, pertaining to or consisting in hæmorrhage. **HÆMORRHODS**, or **HEMORRHODS**, n. plu. *-royds* [Gr. *rhēō*, I flow; *eidos*, appearance]: piles; called in Scripture, *emerods*: see **PILES**, for which disease hæmor-

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rhoids is a technical synonym. HÆM'ORRHOI'DAL, or HEMORRHOIDAL, a. -roy'däl, pertaining to. *Note.*—All the above words, and others, from *haima*, blood, are oftener spelled with *e* than *æ*.

HÆMOSPASTIC, a. *hē-mo-späs'tik* [prefix *hæmo-*; Gr. *spastikos*, stretching, drawing—from *spaō*, I draw]: in *surg.* and *med.*, drawing blood; used of any therapeutic agent for producing an efflux of blood.

HÆMOSTASIA, n. *hē-mo-stā'zī-a* [Gr. *haimostasis*, means of stopping blood]: in *pathol.*, stagnation of blood arising from plethora.

HÆMOTHORAX, n. *hē'mō-thō'rāks* [Gr. *haima*, blood; *thōrax*, the trunk of the body]: applied to the pleural sac filled with blood, or with a fluid of a sanguineous character, which undergoes various secondary changes and degenerations in which the surrounding tissues are also involved.

HÆMOTROPHY, n. *hē-mōtrō'fī* [prefix *hæmo-*; Gr. *trophē*, nourishment: *trephō*, I make firm, I make fat, I nourish]: in *pathol.*, over-richness of blood.

HÆMUS, MOUNT: see BALKAN.

HÆREDITAS JA'CENS, in Scotch Law: the heritable estate which a deceased person has left, as it remains before the heir has made up a title to it, and when therefore the property lies to a certain extent in abeyance. The expression is not used in England, where such niceties of feudal conveyancing have long been extinct.

HÆRETICO COMBURE'NDŌ: old writ in English ecclesiastical law for burning a heretic, now abolished by 29 Char. II. c. 9.

HAFF, *háf*: word obsolete in current German, signifies, in Danish, the sea, or a considerable portion of the sea. In German, it occurs only as the proper name of three estuaries of peculiar form on the southern coast of the Baltic—viz., the Stettin Haff (q.v.), the Frisches Haff (q.v.), and the Kurisches Haff (q.v.). Haff-fishing is a term used by the inhabitants of Shetland to signify sea fishing.

HAFFLIN, a. n. *háf'lin*: in *Scot.*, half-grown; a lad.

HAFIZ, *há'fīz* (one who knows the Koran and the Traditions by heart); 'nom de plume' of MOHAMMED, SHAMS-AD-DIN (Sun of Religion), called also LISHAN-AL-GHAID (Voice of Mystery); eminent Pers'ian theologian, philosopher, and grammarian, and one of the greatest poetical geniuses of all times. b. at Shiraz, beginning of the 14th c.; d. 1388 (A H. 791). He early applied himself to science and learning. His proficiency in various branches of knowledge brought him under the notice of the then reigning House of Muzaffer, and he was not only appointed teacher in the royal family, but a special college was founded for him. His spirit of independence, however, stood in the way of his worldly advancement, and notwithstanding many offers of princely favor, he remained during his whole life in the humble condition of a dervish. The burden of his poetical compositions is for the most part wine, love, nightingales, flowers—in fact,

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beauty in every form; occasionally also the praise of Allah and the Prophet, and reflections on the instability of life and its joys; through all of them there runs, however, a withering contempt of all professional piety, of mock-humility, and of sanctified abhorrence of the good things of this world. These poems are of such exquisite sweetness, that the poet has received the name of *Tscheherleb* (Sugarlip); and his contemporaries speak of his having drunk from the fountain of life, a draught of which was brought to him, in reward for his untiring perseverance in study, and his power of self-abnegation, by Zikhr (the Mohammedan Elijah) himself. No less remarkable are the sudden and striking transitions in his writings, and his readiness of wit on several noticeable occasions.

Hafiz was married, and appears to have reached a happy old age. The enmity, however, which had been provoked in the breasts of the zealous defenders of religion by the freedom of his manners, and his more than Sufistic contempt for the outward forms of Mohammedan piety, broke out undisguisedly at his death. The ministers of religion refused to repeat the usual prayers over the dead body, and after long altercations between the members of his family and his enemies, it was agreed that the question, according to the usual custom of the East, should be decided by lot. The result was favorable; whereupon he was buried with great honor. His tomb, about two m. n. e. of Shiraz, has been adorned with the greatest sumptuousness by princes and nobles, and is still resorted to by pilgrims from all parts of Persia. It has been visited and described by Kämpfer, Pietro della Valle, Chardin, Le Bruyn, Scott Waring, W. Franklin, Ouseley, and others.

How far some of the odes of H. are *bonâ fidz* productions of a most licentious nature, or are intended as an allegorical and mystical revelation of things divine in the manner of Sûfism (q.v.), as is declared by H.'s pious admirers, is a question which has at different times been raised before ecclesiastical and critical courts. A style brilliant, yet clear—imagery gorgeous, yet clothed in pure and unaffected diction—undulating melody and classical harmony, are the chief characteristics of H.'s anacreontic lyrics, which have not only become the national poetry of his country, but are even appealed to as an oracle on most important questions of peace and war. The number of their commentators is legion: the most valuable notes, however, are those of Shemii, Sururi, Sadi. The *Divan* was collected first by Said Kasim Anvari, after the death of the poet. Lithographed and printed editions of H. have been published at Calcutta (1790, 1826), at Bombay (1828-50), at Cawnpore (1831), Bulak (1834-40), Constantinople (1841), etc. A very valuable edition by H. Brockhaus was published at Leipsic 1854-61. Of translations in European tongues, are those of Rewitzki in Latin (Vienna 1771); Richardson, Jones, Ouseley, Hindley, Rousseau, Bicknell (1876) in English; and by Hammer-Purgstall and Daumer, in German.

HAFT—HAG.

HAFT, *n.* *hǣft* [AS. *hæft*, a handle: Icel. *hefta*; Dan. *hefte*, to fetter, to bind: Ger. *haft*, a clasp—*lit.*, the part which is seized]: that part of a cutting instrument by which it is held and used; a handle: V. to set in a handle. **HAF'TING**, *imp.* **HAFTED**, *pp.* *hǣf'tēd*.

HAG, *n.* *häg* [AS. *hæges*; Ger. *hexe*; mid. H.Ger. *hacke*, a witch: connected with **HAGGARD**]: a fury; an ugly old woman; a witch; an eel-like fish; one of the lamprey family. **HAGGED**, *a.* *häg'ēd*, ugly; like a hag. **HAG GISH**, *a.* *-gish*, of the nature of a hag; having a horrid, deformed appearance; ugly. **HAG GISHLY**, *ad.* *-lī*. **HAG-LIKE**, like a hag.

HAG, *n.* *häg* [Ger. *hag*, a fence, a hedge, an inclosure: Dut. *haag*, a hedge]: a quagmire, as a moss-hag. **HAGGARD**, *n.* *häg'gērd*, in *prov. Eng.*, a straw-yard; a farm-yard; a cart-shed; an inclosure: see **HAGGARD** 1.

HAG, *häg* (*Myxine* or *Gastrobranchus*): genus of cartilaginous fishes, allied to lampreys, and with them ranked among Dermopterous Fishes by Owen. The fishes of this genus are of low organization, and seem to connect fishes with cephalopodous mollusks. The vertebral column is reduced to a mere flexible cartilaginous tube, nor are there any other bones. The shape resembles that of an eel or



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worm, and Linnæus placed these animals among the *Vermes*. The mouth is formed by a mere membranous ring, with a single tooth on its upper part, while the tongue is furnished with two rows of strong teeth, and also performs the office of a piston in the use of the mouth as a sucker. Around the mouth are eight barbules or cirrhi, which have been regarded as analogous to the tentacles of the cuttle-fish, and are apparently the principal special organs of sensation. There are no eyes. There are six gill-bags on each side, receiving streams of water from the gullet (*œsophagus*) by as many tubes, the water being admitted to the gullet by an aperture situated rather on the left side, and carried off by a canal which opens about the end of the first third of the length. The tail is surrounded by a narrow fin. The skin is smooth and very unctuous.—One species, the **GLUTINOUS HAG** (*M. glutinosa* or *G. cæcus*), found in the British seas, is more common on the coast of Norway, where it is an object of dislike to fishermen, as they believe it to enter by the mouths of haddocks and other fishes caught in their lines, and to prey upon them so as to reduce them to mere skin and skeleton. A fish which has been thus treated is called a *robbed fish*. Six hags have been taken out of a single haddock. The hag is also said to make its way into fishes

HAGAR—HAGENAU.

through their skin, and is therefore sometimes called the *Borer*. Some suppose, however, that hags are swallowed by the fishes on which they afterward prey. The glutinous hag attains a length of 12 to 15 inches, and exudes a mucous fluid, which soon turns into a kind of jelly. It is of a dark-bluish brown color above, and whitish beneath. The quantity of mucus which it exudes is so great that a single hag, confined in a jar of water, soon turns it all into a kind of jelly. The mucus is exuded from lateral pores.

HAGAR, *hā'gar* (*LXX. Agar*): Egyptian bondwoman of Sarah, Gen. xvi. This her Semitic name (the Egyptian is unknown) has been derived from various roots, and has been translated accordingly—'slender,' 'stranger,' and 'flight' (in allusion to her after-life). Sarah having remained barren up to a very advanced age, at last gave H. to Abraham, ten years after his sojourn in Canaan, as a concubine—according to the Eastern custom—in the hope of through her establishing a family which she could call her own. H. bore Abraham a son, whom he called Ishmael [God has heard], and in whom he for a time saw the future father of the progeny promised him. But 16 years later, and when Abraham was (we are told) a hundred years old, Sarah herself bore Isaac; and we find it significantly repeated nine times in seven verses (Gen. xxi. 2-9) that Abraham and Sarah were his parents—in repudiation, according to rabbinical authorities, of certain rumors about Isaac's illegitimacy, spread by Hagar. At last the domestic contentions that naturally arose led Abraham, though reluctantly, to cast out H. together with Ishmael. How the two fugitives lost their way in the desert of Beersheba; how the water in the bottle being spent, the broken-hearted mother set herself at a distance from her child, in order that she might not see his death; how her weeping and the loud voice of the boy were answered by an angel, who pointed out a well (Temzem, in the inclosure of Mecca)—all this forms one of the most touching and well known narratives of the Bible.

In the New Testament H. is referred to allegorically as Mount Sinai or 'the Jerusalem which now is' (Gal. iv. 22). Some rabbinical traditions (Ber. R. 67 d.) identify her with Keturah, the second wife of Abraham. Gen. xxv. 1; others (Ber. R. 51 d.) make her the daughter of Pharaoh, who, seeing the miraculous interference on behalf of Abraham in Egypt, said: 'Better that my daughter should be the slave of this man than the queen of any other.' The Mohammedans look upon H. as the legal wife of Abraham, and she is supposed to be buried in Mecca.

HAG BERRY: see **BIRD-CHERRY**: **NETTLE TREE**.

HAGEN, *hā'ghen*: industrious and thriving town of Prussia, in Westphalia, on the Volme, 26 m. w. of Arnsberg. Its people carry on puddling and ironfounding, manufactures of iron, steel, and copper goods, cloth, leather, paper, etc. Pop. (1880) 26,295; (1885) 29,611.

HAGENAU, *hā'ghen-now*, or **HAGUENAU**, *hāg-nō'* or

HAGENBACH—HAG-FISH.

Ag-nō': town of the German empire, province of Alsace-Lorraine, ceded by the French in the war of 1870-1; on the Moder, 18 m. n.e. of Strasburg. It had been a free town of Germany before it belonged to France. It was founded 1164 by Frederick Barbarossa, and, as it was intended for the reception of the imperial insignia, it was strongly fortified. It successfully withstood many sieges, especially during the thirty years' war; but on its occupation 1675 by the imperialists, its fortifications were destroyed. Bloody battles took place here between the French and Austrians 1793, Oct. 17, and Dec. 22. H has considerable mfg. industries. Pop. (1880) 12,688; (1890) 14,752.

HAGENBACH, *hā'gēn-bāch*. **KARL RUDOLF**: German theologian: 1801, Mar. 4—1874, June 7; b. Basel, where his father, Karl Friedrich H., author of the *Tentamen Floræ Basileensis*, was prof. of anatomy and botany. While at the universities of Bonn and Berlin he became acquainted with the direction given to theology by Schleiermacher; and on his return to Basel, he received, from his intercourse with De Wette, a fresh theological development. After being an extraordinary prof. he became ordinary prof. of theology 1828, and honorary doctor of theology 1830. He delivered to public audiences beyond the university, and afterward published through the press, several courses of lectures on the Nature and History of the Reformation (*Wesen u. Gesch. d. Reformation*, 6 vols. 1834-43; 2d ed. 1851-56), on the Early History of the Church (*Ältere Kirchengesch.*, 2d ed. 1857-63), and on the Church History of the 18th and 19th Centuries (*Kirchengesch. d. 18 u. 19 Jahrh.*, 2 vols. 3d ed. 1856, translated into English). His tabular view of the History of Dogmas (1828), and his compend of the same department of historical theology (*Lehrbuch d. Dogmengesch.*, 2 vols. 4th ed. 1857, translated into English), are highly praised. His *Encyclopädie u. Methodologie d. Theologischen Wissenschaften* is one of the most useful manuals for the student of German theology, and its popularity in Germany has necessitated nine editions. A History of Evangelical Protestantism, several vols. of Sermons, a Memorial of De Wette, and a work on Religious Education in the Gymnasia, have come from his pen; also two small vols. of poetry, and a collection of poems entitled *Luther u. Seine Zeit*.—Of H's brothers, **JOHANN JAKOB H.** gained distinction as entomologist, and **EDUARD H.** as physiologist.

HAGERSTOWN, *hā'gērz-town*: city, cap. of Washington co., Md.; on Antietam creek, and the Baltimore and Ohio, Cumberland Valley, Shenandoah Valley, and Western Maryland railroads: 6 m. n. of the Potomac river, 20 m. n.w. of Harner's Ferry, 22 m. s. of Chambersburg, 60 m. w.n.w. of Baltimore. It contains a court-house, 12 churches, boys' acad., girls' seminary, high, graded, primary, and parochial-schools, and manufactories of machinery, carriages, pottery, leather, etc. Pop. (1870) 5,779; (1880) 6,627; (1890) 10,118; (1900) 13,591.

HAG-FISH, or **GLUTINOUS HAG**, or **BOR'ER**: see **HAG**.

HAGGADA—HAGGAI.

HAGGADA, *häg-gá'da* [Heb. from *nagad*, *hagged*, to say, relate]: free, rabbinical interpretation of Scripture, chiefly for homiletical purposes. As its name signifies, H. was something 'said' (not 'received,' like the authoritative Halacha, q.v.): legend, saga, tale, gnome, parable, allegory; in fact, poetry springing up from the sacred soil, wild, luxuriant, and entangled like a primeval forest. It had three principal directions—the *Peshat* or hermeneutical investigation, *Derush* or practical application, and *Lod* or mystical illustrations. Zunz's minute divisions are: 1. Targumim; 2. Haggadistic elements in Halacha; 3. Ethical H.; 4. Historical H.; 5. Secret esoteric doctrine; 6. Special H. It flowed in an uninterrupted stream for more than a thousand years—from the Babylonian exile to the 10th c.—and its innumerable authors are either entirely anonymous or at best pseudonymous. It grew into immense dimensions, as, although orally delivered, parts were gradually added as marginal notes or glosses to Bible mss., or were committed to writing as independent collections. These either followed the order of the scripture and were called after the special biblical book around which they had woven their fabric, or they were arranged and called after the Sabbatical and festive pericopes on which they treated. The most extensive collections, originally composed of single fragments which have survived are: *Midrash Rabbah* (commenced about A.D. 700 concluded about 1100), comprising the *Pentateuch* and the five *Megilloth*; and the *Pesikta* (about 700), which contains the most complete cycle of pericopes. Strangely, this latter itself had, through the many extracts made from it at an early period (*Jalkut*, *Pesikta*, *Rabbathi*, *Sutarta*, etc.), fallen into oblivion since the 15th c., until Zunz, in *Die Gottesdienstl. Vorträge der Juden* (Berlin 1832), not only proved its existence by evidence, but even restored it out of these fragments and parallel passages; and about the same time, the old ms. which agreed with Zunz's statements to the minutest details, was found by Steinschneider at Oxford.

For the general form of H. its language, its sources, and its development, no less than its vast influence on Christianity and Mohammedanism, and its immense usefulness for historical and theological investigations, see **MILDRASH: TALMUD**.

Haggada shel Pesach is the name of a ritual, partly in Hebrew, partly in Chaldee, used on the first two evenings of the Passover; which contains, besides a brief description of the exodus, extracts from the Scripture, the Mishna, *Tosephta*, *Mechilta*, *Sifri*, and the two Talmuds, and some liturgical pieces. Originally, within a very small compass, it has been extended to its present larger size through centuries. Two 'Piutim,' or religious poems, were added in the 11th c., and four more Hebrew and Chaldee songs (the last originally a German *Volkslied*) as late as the 14th century.

HAGGAI, *häg'gai* (*Aggeus*, *Haggæus*): tenth of the 12 minor prophets of Israel, and the first of those who prophesied, in Palestine after the Babylonian captivity, Of his

own history, nothing positive is known. It is related that he was born in Babylon, of priestly lineage, and came to Jerusalem at a very early age. The Church Fathers suppose him to have been one of the exiles who had returned with Zerubbabel and Joshua; and Ewald infers from ii. 3, that he was one of the few who had seen the first temple, in which case he must have been a very old man when he composed his book. The time of his prophecies, however, is known with accuracy to fall in the 6th, 7th, or 8th month of the second year of Darius Hystaspis (cf. Ezra, v. 1; vi. 14; Haggai, iv. 24) = B. C. 520. Fifteen years had then elapsed since the foundations of the new temple had been laid; but during the reign of Cambyses and Pseudo-Smerdis, the work had been neglected, and even the most zealous men began to think that the time of the re-establishment of the sanctuary was not yet at hand. Suddenly, H. presented himself before Zerubbabel and Joshua the high priest, and strongly urged the re-establishment of the sanctuary, pointing at the same time to the famine in the land, as the divine punishment for the culpable neglect of the people, who thought only of their own houses, and not of that of God. His words made a deep impression, and the building was recommenced (i). The second discourse of the prophet—about a month later—predicts a still greater glory to the new temple than had belonged to the former—(ii. 3-9). Two months afterward he had to renew his reproaches against their inertness, and his promises of a blessed future (ii. 10-19). The fourth prophecy (ii. 20-23), delivered on the same day, is directed to Zerubbabel, and foretells great revolutions and political changes; but he, Zerubbabel, shall remain a 'signet' in the hands of God—i.e., the Jews and their princely leaders would not be harmed.

The style of H. is prosaic, and labors under an unusual tameness and poverty of expression, apparent principally in the frequent repetition, within the short space of two chapters, of certain words and phrases, which could scarcely have been retained for ornamentation (Eichh. Einl. s. 599). There is hardly any parallelism; but the prophet has endeavored to impart a certain vivacity to his writing by means of interrogation. The diction itself is generally pure and clear. H.'s name appears joined to that of Zachariah in some of the inscriptions of the psalms (cxxvii. and cxlv.—cxlviii., in Septuagint; cxxv., cxxvi., cxlv.—cxlviii., in Peshito, cxi. and cxlv., in Vulgate), a fact which points to the existence of an old tradition about these prophets having striven for the re-establishment of the music and singing of the psalms in the temple. Some critics suppose the present book of Haggai to be simply an epitome of some larger book, or a condensation of H.'s orally delivered prophecies. If so, they have certainly not gained in strength by such compression.

HAGGARD, a. *häg'gêrd* [F. *hagard*, wild, strange—from mid. L. *haga*, a hedge—from Ger. *hag*, a wood, a thicket, and the postfix *ard*: applied formerly to the wild hedge or wood birds, then to the gaunt appearance of ill-kept hedges

HAGGARD—HAGIOGRAPHY.

in the dark]: wild and rough in appearance; having sunken eyes; gaunt or lean: N. anything wild or irreclaimable; a wild or unreclaimed hawk. HAG'GARDLY, ad. -lī HAG, n. *häg*, or HAG'GER, n. -gēr, in *Scot.*, a person employed in felling timber; the smaller branches of felled timber used as firewood. *Note.*—There is also a suggested etymology of HAGGARD, a hawk, from an OF. *vagard*—from a supposed mid. L. *vagardus*, meaning 'the wandering bird.'

HAGGARD: see under HAG 2.

HAGGARD, *häg'árd*, HENRY RIDER: novelist: 1856, June 22— ———; b. Norfolk, Eng. He attended Ipswich grammar school; went to Natal, Africa, as sec. to Sir Henry Butler, 1874; became master of the high court in the Transvaal; read aloud in the volksrad the proclamation declaring the Transvaal British territory; returned to England 1879; was called to the bar in London; and visited the U. S. 1890-91. After the publication of *Cetewayo and His White Neighbors* (1882), his first novel, *Dawn* (1884), came out, followed by *The Witch's Head* (1885). Till this time his stories had not attracted much attention, but now succeeded two novels, *King Solomon's Mines* (1886) and *She* (1887), which placed him among the most popular sensational writers of the day. Others of his novels are: *Jess* (1887); *Allan Quatermain* (1888); *Cleopatra* (1889); *Beatrice* (1890); *Eric Brighteyes* (1891); and *Nada, the Lily* (1892).

HAGGIS, n. *häg'gīs* [*Scot. haggis*; F. *hachis*, a hash]: Scotch dish, called by Burns the 'great chieftain o' the puddin' race. It is made usually with the large stomach-bag of a sheep, one of the smaller bags, called the king's hood, together with the lights, the liver, and the heart. After the stomach-bags have been well cleansed, the small bag is boiled with the pluck. A quarter of the liver is now grated down, the heart, lights, and small bag are minced very fine with half-a-pound of beef-suet. Two small tea-cupfuls of oatmeal previously browned before the fire, are added, with salt, black and Jamaica pepper, and half a pint of the liquor in which the pluck was boiled; sometimes a little minced tripe is added. The whole is now stirred together, put in the large bag, which is sewed up, and afterward boiled for about three hours.

HAGGLE, v. *häg'l* [*Scot. hag*, to hew, to mangle: connected with HACK 2]: in *OE.*, to hew; to mangle; to chop HAGGLING, imp. *häg'ling*. HAGGLED, pp. *häg'ld*.

HAGGLE, v. *häg'l* [*Swiss, haggeln*, to wrangle: prov. Dan. *hagga*, to hew, to hack; *hakka*, to peck, to keep finding fault with: *Scot. hogglin*, unsteady]: to hack or dispute; to be difficult in bargaining; to stick at small matters. HAGGLING, imp. *häg'ling*. HAGGLED, pp. *häg'ld*. HAGGLER, n. -lēr, one who. TO KEEP AGGING AT ONE, in *OE.*, to tease or provoke one much: see AGG.

HAGIOCRACY, n. *häg-ĩ-òk'ra sī* [*Gr. hagios*, holy; *krateō*, I rule or govern]: a sacred government; a hierarchy; the rule or government of the priesthood.

HAGIOGRAPHY, n. *häg'ĩ-òg'ră-fū*. or HAG'IOG'RAPHY,

HAGIOLOGIST—HAGUE.

n. *ḥl* [Gr. *hḡgḡs*, holy; *graphō*, I write]: a certain division of the Old Testament Scriptures, comprising Chronicles, Nehemiah, Ezra, Esther, Job, Psalms, Proverbs, Ecclesiastes, Canticles, and Daniel; the sacred writings; the holy Scriptures. HAG IOG RAPHAL, a. *-rā-fāl*, pertaining to the sacred writings. HAG IOG RAPHER, n. *-rā-fēr*, one of the writers of the Hagiographa: see BIBLE.

HAGIOLOGIST, n. *hḡg'ī-ōl'ō-jīst* [Gr. *hḡgḡs*, holy; *logos*, a word]: one who writes or treats of the sacred writings. HAG IOLOGY, n. *-ō-jī*, the history of saints.

HAGUE, or THE HAGUE, *hāg* (Dutch, *'s Gravenhage*; Fr. *La Haye*): city of S. Holland, cap. of the Netherlands, and residence of the king; pleasantly situated and well-built, half Dutch, half French in appearance. Pop. (1891) 165,560. It is intersected in all directions by canals, and shady avenues of linden-trees, and abounds in palaces, public buildings and stately houses. It has a good public library of 100,000 vols, and fine galleries of paintings, the choicest of which, containing some of the most precious specimens of the Dutch school, is in the palace of the king. The town contains 20 churches, the most notable of which is the Great Church, founded 1308, distinguished for its lofty hexagonal tower with a *carillon* of 38 balls. The H is the seat of both chambers of the states-general, and of various tribunals and public offices, in one of which are deposited the archives and state papers, preserved by the republican and regal governments of the country for 400 years. In a historical view, the most interesting buildings of the H. are the Gevangenpoort, or the prison gate-house, in which Oldenbarnevelt, the brothers De Witt, and many others distinguished in the history of Holland, have at different periods been confined; the Binnenhof, in which the former of these patriots was put to death, and which, together with the Buitenhof, forms an irregular mass of public buildings of various ages, enclosed by moats, and approached by draw-bridges. Besides the palace of the king, there are, within the city, several others occupied by members of the royal family, or with various national collections of interest, the most notable of which is the Mauritz Huis, containing a splendid collection of pictures by the Dutch masters. The palace called 't Huis in 't Bosch (The House in the Wood), on the outskirts of the town, in the midst of a noble wood, is notable specially for the tapestry, and the frescoes and other paintings which it contains by Rubens, who, in conjunction with several of his most distinguished pupils, painted the ceiling and walls of several apartments. The H. is essentially a city of fashion, and its prosperity depends chiefly on the court and nobility. The trade consists principally of book-printing, lithographing, metal-founding, carriage-building, beer-orewing, distilling gin, cabinet-work, rope-spinning, making leather, etc.; and the natives of the port (Scheveningen) gain a livelihood by fishing. In the neighborhood are many handsome country-seats; and not far off is Ryswick, where the treaty of peace was signed 1697. Scheveningen is a

HAGUENAU—HAHNEMANN.

favorite bathing-place on the sea-coast, with which the H. is connected by a broad causeway, bordered with rows of trees. The origin of the H. is very ancient, and as far back as 1250, William, Duke of Holland and Emperor of Germany; erected a hunting-seat there, on the site of an older residence of his predecessors. In the 16th c. it was the seat of govt. of the states-general; and in the next century it became the birthplace of many distinguished members of the House of Orange, among them William III. of England; while, as the residence of the stadtholders, it was naturally the centre of the numerous important negotiations of European diplomacy, with which they were associated. The H. is connected by a railway with Amsterdam, 36 m. n., and Rotterdam, 13 m. south.

HAGUENAU': see HAGENAU.

HAH! int. *hã*: see HA.

HA-HA BAY: inlet of Saguenay river in Chicoutimi co., Quebec, Canada, midway between Lake St. John and the St. Lawrence river; known also as Grande Bay. It is connected with Great and Little Ha-Ha Lakes directly s., by the Ha-Ha river, the bay is about 7 m. long, 1 m. wide, and 600 ft. deep, and at its head has accommodations for the largest vessels to load and unload. The scenery is beautiful, the surrounding dist. agriculturally rich, and the pretty villages of St. Alexis and St. Alphonse on the upper shores of the bay are famous summer resorts.

HAHNEMANN, *hã neh-mãn*, SAMUEL CHRISTIAN FRIEDRICH: 1755, Apr. 10—1813, July 2; b. Meissen, small town near Dresden: German physician. His father—a painter of the ware known as Dresden china—intended his son to follow his own occupation, but the boy showed such love of letters that the head-master of the college (*Fürstenschule*) of Meissen afforded him gratuitously all the advantages of that institution, in which he remained till 20 years of age. He then left Meissen, with 20 crowns as his whole fortune, and went to Leipsic for medical studies. Here he maintained himself by translating works out of Latin, French, and English into German. By industry and frugality, he saved enough money to enable him to visit Vienna, where, under the direction of Dr. Quarin, he pursued his studies, and after various vicissitudes, he returned to Saxony, and settled in Dresden 1784. He had taken the degree of M.D. at Erlangen 1779. At Dresden he discovered a new salt of mercury, *Mercurius Solubilis Hahnemanni*, still extensively employed by physicians in Germany. After four years in Dresden, where he had for a time the direction of a large hospital, he returned 1789 to Leipsic. In 1790, while translating Cullen's *Materia Medica* out of English into German, his attention was arrested by the insufficient explanations in that work of the cure of ague by cinchona bark. By way of experiment, he took a large dose of that substance, to ascertain its action on the healthy body. In the course of a few days, he experienced the symptoms of ague; and it then occurred to him that perhaps *the reason why cinchona cures ague is because it has the power to produce symptoms in a*

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healthy person similar to those of ague. To ascertain the truth of this conjecture, he ransacked the records of medicine for well-attested cures effected by single remedies; and finding what he deemed sufficient evidence of this fact, he advanced a step further, and publicly proposed 1797, to apply this new principle to the discovery of the proper medicines for every form of disease. Soon afterward, he published a case to illustrate his method—a very severe kind of colic cured by a strong dose of *Veratrum album*. Before this substance gave relief to the patient, it excited a severe aggravation of his symptoms: this induced H., instead of drops and grains, to give the fraction of a drop or grain, and he thus introduced *infinitesimal* doses. Some years later, he applied his new principle in the treatment of scarlet fever; and finding that belladonna cured the peculiar type of that disease which then prevailed in Germany, he proposed to give this medicine as a *prophylactic*, or preventive against scarlet fever. From that time it has been extensively employed for this purpose. In 1810 he published his great work *Organon of Medicine*, which has been translated into all European languages, and into Arabic. In this book he fully expounded his new system, which he called Homœopathy: see HOMŒOPATHY. His next publication was a *Materia Medica* consisting of a description of the effects of medicines upon persons in health. These works were published 1810–21, at Leipsic, where he founded a school, and was surrounded by disciples. As his system involved the administration of medicines, each separately, and in doses indefinitely minute, there was no longer any need of the apothecary's intervention between the physician and the patient. In consequence of this, the Apothecaries' Company brought to bear on H. an act forbidding physicians to dispense their own medicines, and with such effect that he was obliged to leave Leipsic. The Grand Duke of Anhalt-Köthen appointed him his physician, and invited him to live at Köthen. Thither he removed 1821, and there he prepared various new editions of his *Organon* and new volumes of his *Materia Medica* for publication. In 1835, he married a second time, left Köthen, and settled in Paris, where he had great reputation till his death. On the centenary of his birth-year, 1855, a statue was erected to his honor at Leipsic, at the expense of his disciples in Germany, France, England, and other countries, with the concurrence of the local authorities, who supplied the site in one of the public places.

His theories have been met with intense opposition, and declared to be fallacy and folly by adherents of the old school; but he is universally conceded to have been a man of great genius, industry, erudition, and courage. Jean Paul Richter calls him 'a prodigy of philosophy and learning.' He was of unblemished purity of morals; and his life, as well as his writings, was characterized by strong natural piety. He left a numerous family of sons and daughters.

HAHN-HAHN, *hân'hân*, IDA, Countess: authoress: 1805, June 22—1880, Jan. 12; b. Tressow, Mecklenburg-Schwe-

HAIDARABAD—HAIL.

rin; daughter of Karl Friedrich, Count von Hahn. At the age of 21, she married a kinsman; but the union was dissolved 1829. She travelled much in Europe and the East. In 1850, sick of her restless life, she embraced Rom. Catholicism, and entered a convent at Angers. Her writings, consisting of poems, novels, voyages, etc., are voluminous, and are generally marked by sentimentality, aristocratic prejudice, and intensely ultramontane views. The best known of her novels are *Gräfin Flustine*, *Ulrich*, and *Clelia Conti*.

HAIDARABAD': see HYDERABAD.

HAIDUK: see HADJUK.

HAIFA, in Syria: see CAIFA.

HAIGHT, *hāt*, CHARLES COOLIDGE: architect: b. New York, 1841; son of Rev. Benjamin I. H., D.D. He graduated at Columbia College 1861, studied architecture, became asst. inspector-gen. in the civil war, and afterward was appointed architect to the corporation of Trinity Church. His professional work includes designs for the new buildings of Columbia College, the General Theol. Seminary, the Manhattan Eye and Ear Hospital, and the Bar Assoc. in New York, St. Luke's Cathedral, Portland, Me., and other notable structures.

HAIL! int. *hāl* [Goth. *hails*; AS. *hal*, sound, healthy; Icel. *heil*, hale, whole (see HALE 1)]: a word expressive of a wish for one's health: N. a familiar greeting; a reverential salutation.

HAIL, v. *hāl* [Icel. *heilsa*, to say hail to one: Low Ger. *anhalen*, to call to one: Dut. *halen*, to send for]: to address one in passing; to call after loudly. HAIL'ING, imp. HAILED, pp. *hāld*. HAIL-FELLOW, a companion.

HAIL, n. *hāl*, HAILS, n. plu. *hālz* [Icel. *hille*, I cover or conceal]: in *Scot.*, the place where those that play at football or other games strike off; the act of driving a bail to the boundary, or reaching it; goals. *Note*.—WHERE DO YOU HAIL FROM? means, 'where do you come from?' but is also alleged to mean, 'where do you *sail* from?' in the latter case, *hail* may be from Gael. *seol* or *sheol* = *hāle*, to sail; to guide.

HAIL, n. *hāl* [AS. *hagol*; Ger. *hagel*; Norw. *hagl*, hail; Norw. *hagla*, to fall in drops]: drops of rain frozen while falling: V. to pour down like hail. HAIL'ING, imp. HAILED, pp. *hāld*. HAILY, a. *hāl i*, consisting of hail. HAILSTONE, n. a drop of rain frozen while falling. HAILSTORM, hail dropping with great force, or driven by the wind.—*Hail* is unfortunately used to denote two phenomena of apparently different origin. In French, we have the terms *grêle* and *grésil*—the former, hail proper; the latter the fine grains, like small shot, which often fall in winter, much more rarely in summer, and sometimes precede snow. The cause of the latter seems to be simply the freezing of rain-drops as they pass in their fall through a colder region of air than that where they originated. We know, by balloon ascents and other methods of observation, that even in calm weather different strata of the atmosphere have

HAIL.

extremely different temperatures, a stratum far colder than the freezing-point being often observed between two others comparatively warm.

But certain facts tend to show that true hail, though the process of its formation is not perfectly understood, depends mainly upon the meeting of two nearly opposite currents of air—one hot and saturated with vapor, the other very cold. This is shown by such facts as the following. A hailstorm is generally a merely local phenomenon, or, at most, ravages a belt of land of no great breadth, though it may be of considerable length. Hailstorms occur in the greatest development in the warmest season, and at the very warmest period of the day, and generally are most severe in the most tropical climates. A fall of hail generally *precedes*, sometimes accompanies, and rarely if ever follows, a thunder-shower. A common notion which has found its way, as many popular prejudices do, into scientific treatises, assigns electricity as the origin of hail; but all observation, rightly interpreted, seems to show that electricity and hail are *results* of the same combination of causes.

When a mass of air saturated with vapor, rising to a higher level, meets a cold one, there is of course instant condensation of vapor into ice by the cold due to expansion; at the same time, there is generally a rapid production of electricity, the effect of which, on such light masses as small hailstones is to give them in general rapid motion in various directions successively. These motions are in addition to the vortex motions or eddies, caused in the air by the meeting of the rising and descending currents. The small ice-masses, then moving in all directions, impinge upon each other, sometimes with great force, producing that peculiar rattling sound which almost invariably precedes a hail-shower. At the same time, by a well-known property of ice (see REVELATION), the impinging masses are frozen together; and this process continues until the weight of the accumulated mass enables it to overcome the vortices and the electrical attractions, when it falls as a larger or smaller hailstone. Examining such hailstones, which may have any size from that of a pea to that of a walnut, or even an orange, we at once recognize the composite character which might be expected from such a mode of aggregation. Hailstones in tropical countries are reported to have fallen sometimes as large as a sheep, sometimes large as an ox, or even an elephant! But it is probable that the aggregation in these cases was produced by regelation at the surface of the earth, when a series of large masses had impinged on each other, having fallen successively on the same spot. Whether this be the true explanation or not it is certain that in British India, at the warmest season, hailstones have remained of considerable size for many days after their fall. A curious instance of the fall of large hail, or, rather, ice-masses, occurred on a British naval vessel off the Cape, 1830, Jan. Here the stones were the size of half-bricks, and beat several of the crew off the rigging, doing serious injury.

A disastrous hailstorm is described in *Mem. de l'Acad. des*

HAILES—HAIMURA.

Sciennes, 1790. This storm passed over parts of Holland and France, 1788, July, travelling *simultaneously* along two miles nearly parallel: the eastern one had a breadth of from half a league to five leagues; the western, of from three to five leagues. The space between, varying from three to five and a half leagues wide, was visited only by heavy rain. At the outer border of each portion of the storm, there was also heavy rain; but we are not told how far it extended. The general direction of the meteor was from s.w. to n.e. The length was at least a hundred leagues, probably two hundred. It seems to have originated near the Pyrenees, and to have travelled at a mean rate of about $16\frac{1}{2}$ leagues per hour toward the Baltic, where it was lost sight of. The hail fell for only about 7½ minutes at any one place, and the heaviest hailstones weighed about eight French ounces. This storm devastated 1039 parishes in France alone, doing damage to the extent of nearly \$5,000,000. See METEOROLOGY.

HAILES, LORD: see DALRYMPLE, SIR DAVID.

HAILEYBURY COLLEGE, *h'ī'ū b'ēr-ī*: in the s.e. border of Herts. England; founded 1805, as a college for the education of the E. India Company's cadets; and used until the transference of the powers of the E. India Company (q.v.) to the govt of India (see INDIA, BRITISH) led to the new system for selecting men for the Indian civil service by competitive examination. Its place is now occupied by a high-class school or college, incorporated 1864.

HAI'MON: see AYMON.

HAIMS, n. plu. *hāmz*, or HAMMYS, n. plu. *hām'mīs*, and HEMS, n. plu. *hēmz*: Scotch spellings of HAMES, the iron bars on a working horse's collar.

HAIM'SUCKEN: see HAMESUCKEN.

HAIMURA, *hā-mū'ra* (*Erythrinus macrodon*): large freshwater fish of Guiana, highly esteemed for the table. It be-



Haimura.

longs to a small family of fishes, *Erythrinidae*, related to the herring, salmon, and carp families. It is sometimes four ft. in length. The teeth are large, and so formidable, that instances are said to have occurred of a captured H. biting off a man's hand. The H. abounds particularly in the upper parts of the rivers of Guiana.

HAIN—HAINBURG.

HAIN, or **HANE**, *v.* *hān* [Scot.]: to spare; not to expend; to save from exhaustion by bodily labor or fatigue. **HAIN'ING**, *imp.* **HAINED**, *pp.* *hānd*.

HAIN: see **GROSSENHAIN**.

HAINAN, *hī-nān'* (Chinese, *Kiung-chow-foo*): large island in the China Sea, constituting a *foo*, or dept., of the province of Kwangtung; about 160 m. long and 90 m. in average breadth; 1200–1400 sq.m.; separated from the mainland by the straits of H., 15–20 m. wide, filled with shoals and reefs. Its cap. and principal city is Kiung-chow-foo (*q.v.*). The interior of the island is mountainous, and only a portion gives submission to the Chinese. Part of the aborigines are wild tribes known as Sheng-li. The s. part has a tropical climate. Earthquakes are frequent. Its productions are rice, sweet potatoes, sugar, tobacco, fruits, timber, and wax. Typhoons, or cyclones, are frequent off the coast during summer. Whaling is pursued here with success by Chinese. When the Chinese conquered it, B.C. 111, they brought from the mainland 23,000 families. Chinese records give pop. (1300) 166,257; (1370) 291,000; (1617) 250,524; (1835) 1,350,000; present pop. estimated 2,500,000.

HAINAULT, or **Fr. HAINAUT**, *ā-nō'* (Ger. *Hennegau*): frontier province of Belgium, bounded s.w. by France. The name may be spelt about 900 different ways, mostly historical, without altering the (French) pronunciation; e.g. *Héno*, *Haysneaultx*. Area, 1424 sq. m. The surface consists, in the n. and w., of flat and fruitful plains; the s. is occupied by the Forest of Ardennes. Hills occur only in the s.e., and consequently the course of most of the rivers is toward the w. and n.w. The principal rivers are the Haine—from which the province has its name—the Scheldt, the Dendre, and the Sambra, the last a tributary of the Meuse. The soil is highly productive; wheat and flax are very extensively grown. Excellent breeds of horses, horned cattle, and sheep are reared. Toward the w., in the neighborhood of Mons, are extensive coal-fields: here are more than 200 coal-pits, from which about 2,000,000 tons of coal are annually exported. Iron also is produced in considerable quantity, and marble, building stone, and limestone are quarried. Linen, porcelain, and pens are extensively manufactured. Pop. (1887) 1,041,719; (1900) 1,142,554.

HAINAUT (or **HAINAULT**), **FRENCH**: see **NORD** (department).

HAINBURG, *hān'būrĕh*, or **HAIBURG**, *hām'būrĕh*: small but old and interesting town of Austria, in the crown-land of Lower Austria; on the right bank of the Danube, 27 m. e.s.e. of Vienna, 2 m. from the Hungarian frontier. It is surrounded by old walls, pierced by two castellated gates, and contains an imperial tobacco-factory, the largest in the country; an institution for cadets; and an infantry school. Among its notable edifices are the town-house, with a Roman altar; a tower, called the Roman tower, with the supposed statue of Attila; and, on the summit of the Castle Hill, the remains of an old castle, destroyed

HAINES—HAINICHEN.

1596, when its powder-magazine was struck by lightning. Pop. (1869) 4,178; (1880) 4,857.

Many consider H. the ancient *Carnuntum*, once an important Roman stronghold and the station of the Danubian fleet, and which rose to its highest prosperity during the reign of M. Aurelius. However this may be, it is certain that considerable remains of the fortifications of *Carnuntum* are found in the immediate vicinity. A Roman aqueduct still supplies the market of H. with water. In the *Nibelungenlied*, the castle of H. is called Heimburg, the border fortress of the country of the Huns. It was forcibly taken from the Hungarians, 1042, by Emperor Henry III., and afterward it became a residence of the Austrian princes.

HAINES, *hānz*, DANIEL: 1801, Jan. 6—1877, Jan. 26: b. New York: lawyer. He graduated at the College of New Jersey 1820, was admitted to the bar 1823, settled in Hamburg, N. J., to practice 1824, was elected member of the N. J. council (now senate) 1837, and as a member of the board of canvassers resisted Gov. Pennington in giving certificates of election to the whig candidates in the famous 'broad seal' election. In 1843 he was chosen by the legislature gov. and chancellor of the state, and in his one-year term proclaimed the new constitution and did much to improve the condition of the public schools and establish the N. J. State Normal School. He was re-elected gov. for a three years' term 1847; was a judge of the N. J. supreme court 1852-66; member of several judicial commissions 1870-76; commissioner to the National Prison Reform Congress, Cincinnati 1870; member of the committee to organize the International Congress on Prison Discipline and Reform which met in London 1872, and of which he was a vice-pres.; one of the committee on the re-union of the two branches of the Presb. Church, and a war democrat during the civil war.

HAINICHEN, *hī'nīch-ën*: town of Saxony, 28 m. w.s.w. of Dresden, on a tributary of the Mulde. Wool-spinning, weaving, and the manufacture of cloth are carried on. Pop. 8,500.

HAIR.

HAIR, *n.* *hār* [Dut. *haar*; Icel. *hár*; Ger. *haar*, hair]: fibres or threads of different degrees of fineness which cover the bodies of many animals; anything very small and fine having length. **A HAIR**, a single hair; a fine slender thread or filament. **THE HAIR**, the whole collection or body of threads or filaments growing upon an animal, or upon any distinct part. **HAIRY**, *a.* *hārī*, covered with hair; resembling hair. **HAIRINESS**, *n.* *-nēs*, the state of being covered or abounding with hair. **HAIRLESS**, *a.* without hair. **HAIRBELL**, or **HAREBELL**, a wild plant with blue pendulous flowers; the Scotch blue-bell: see under **BLUE**: also **HAREBELL**. **HAIRBRAINED**, wild and irregular; fickle and unsteady—properly **HAREBRAINED**, which see under **HARE**. **HAIR BREADTH**, or **HAIR'S-BREADTH**, a very small distance; among the *Jews*, the 48th part of an inch. **HAIR-BRUSH**, a brush for smoothing and dressing the hair. **HAIR-CLOTH**, a woven fabric chiefly composed of horse-hair (see **HAIR MANUFACTURES**). **HAIR-GLOVES**, gloves made of horse hair for rubbing the skin while bathing. **HAIR LINE**, a fishing-line made of horse hair. **HAIRLIP**, another spelling of **HARELIP**, which see under **HARE**. **HAIR-MOLD**, *hār-mōld* [Scot. *har*; Icel. *hírr*, white]: in *Scot.*, the mold on bread like hoar-frost. **HAIR-NET**, a net for inclosing a woman's hair. **HAIR OIL**, oil for moistening the hair, generally perfumed. **HAIR PENCILS**, small brushes made of fine hairs used by artists. **HAIR-PIN**, a bent wire, or a double pin, for fastening a woman's hair. **HAIR SALT**, a popular name for native sulphate of magnesia, appearing as fine capillary incrustations on damp walls. **HAIR SHIRT**, *n.* in *eccles* and *chh. hist.*, an instrument of penance, made of horse-hair; strictly speaking it is a broad band rather than a shirt, and is worn round the loins giving to the wearer constant annoyance. Among the Carthusians it forms part of each monk's ordinary apparel. **HAIR SIEVE**, a strainer with a haircloth bottom. **HAIR-SPLITTING**, the act or practice of making minute or fine-drawn distinctions. **HAIR-SPRING**: see **BALANCE—BALANCE SPRING**. **HAIR-WORM**: see **GORDIUS**. **AGAINST THE HAIR**, against the grain; contrary to the nature of a person or thing.

HAIR (including bristles, wool fur, etc.): a modification of the Epidermis (*q v.*), and consists essentially of nucleated particles. An ordinary hair consists of a *shaft* and a *bulb*. The shaft is that part which is fully formed and projects beyond the surface. If we trace it to the skin, we find it rooted in a follicle in the cutis or true skin, or even in the connective or cellular tissue beneath it. This follicle is bulbous at its deepest part, like the hair which it contains, and its sides are lined with a layer of cells continuous with the epidermis. The layer (*b*) in fig. 1, according to Todd and Bowman (*Physiological Anatomy*, I, 417), 'resembles the cuticle in the rounded form of its deep cells, and the scaly character of the more superficial ones, which are here in contact with the outside of the hair (*c*). The hair grows from the bottom of the follicle, and the cells of the deepest stratum gradually enlarge as they mount in the soft bulb of the hair, which owes its size

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to this circumstance. If the hair is to be colored, the pigment cells also are here developed. It frequently happens that the cells in the axis of the bulb become loaded with

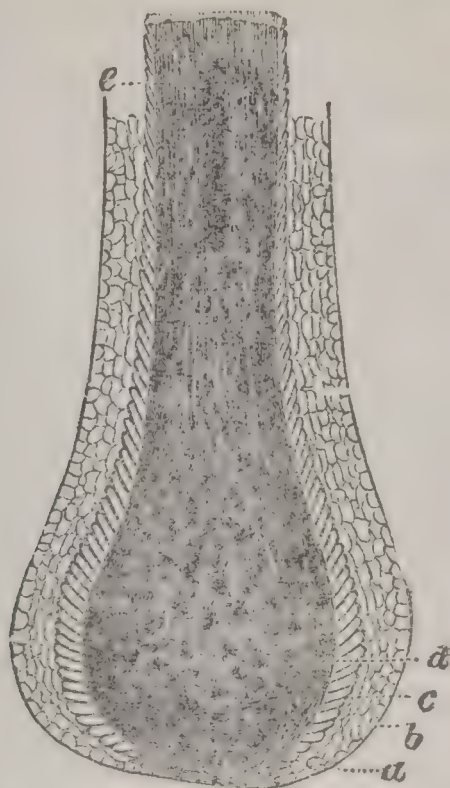


Fig. 1.

Magnified section of bulb of a small black human hair.

a, basement membrane of the follicle; *b*, layer of epidermic cells resting upon it; *c*, layer of imbricated cells, forming the outer lamina, or *cortex* of the hair; *d*, more bulky cells containing pigment; *e*, a mass of cells in the axis of the hair, loaded with pigment.

pigment at one period, and not at another, so that, as they pass upward in the shaft, a dark central tract is produced, of greater or less length, and the hair appears here and there to be tubular (*e*). The shaft is much narrower than the bulb, and is produced by the rather abrupt condensation and elongation into hard fibres of the cells, both of those which contain pigments and those which do not.' If the tissue is softened by acetic acid, these fibres may be



Fig. 2.

Surface of human hair, magnified

readily seen under the microscope; they seem to be united into a solid rod by a material similar to that which cements the scales of the cuticle. The central cells, when filled with pigment, have less tendency to become fibrous than those lying more externally; and hence some writers have described the centre as a *medulla*, in distinction from the more fibrous part of the shaft, which they term the *cortex*. (This tubular character is constant in the hair of many animals, but is very variable in human hair, and even in the same hair at different parts of its length.) The term *cortex* or *bark* is more correctly applied to the single outermost layer of cells which overlap one another, and cause the sinuous

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transverse lines which are seen in examining a hair under the microscope.

In some hairs, especially those which act as tactile organs in some of the lower animals (e.g. in the whiskers of the various cats), a true papilla, furnished with nerves and capillaries, projects into the hair-bulb, and an approach to this papillary projection may often be seen in human hairs.

The hairs, like epidermis, are thus seen to be organized, and to maintain a vital, though not usually a vascular connection with the body. The color of hair seems to depend on the presence of a peculiar oil, which is of a sepia tint in dark hair, blood-red in red hair, and yellowish in fair hair. This oil may be extracted by alcohol or ether, and the hair is then left of grayish-yellow tint. The chemical composition of hair closely resembles that of horn: see **HORN**Y TISSUES.

Hair is extremely strong and elastic; hence its uses for the construction of fishing-lines, the stuffing of cushions, balls, etc. One of its physical properties is, that when dry and warm it is easily rendered electrical, and that it is extremely hygroscopical; readily attracting moisture from the atmosphere, and no doubt from the body also, and yielding it again by evaporation when the air is dry. Hairs elongate very considerably when moist—a property of which Saussure availed himself in the construction of his hygrometer, in which a human hair, by its elongation and contraction, according as the atmosphere is moist or dry, is made to turn a delicate index.

Hairs are found on all parts of the surface of the human body, except the palms of the hands and the soles of the feet; they differ, however, extremely in length, thickness, shape, and color, according to situation, age, sex, or race. The differences dependent on situation, age, and sex are so obvious that we pass them and proceed to the most important differences dependent on race. With respect to the quantity of hair that grows on the human body, there are great differences in different races. The Mongols, and other northern Asiatics who are similar to them, are noted for the deficiency of their hair and for scanty beards, and the same character is ascribed to all the American nations; while among the *Ainos*, or in the Kurilian race, there are individuals who have the hair growing down the back, and covering nearly the whole body. The northern Asiatics and the Americans have generally straight lank hair, while Europeans have it sometimes straight and flowing, and occasionally curled and crisped. Negroes present every possible gradation, from a completely crisp, or what is termed woolly hair, to merely curled, and even to flowing hair; and it is similar with the natives of the islands in the great Southern Ocean. As there is a generally diffused opinion that the head of the African is covered with a species of wool instead of with true hair, it is to be noted that all true wools which have been examined microscopically (as merino wool, the wool of the tiger, rabbit, bear, seal, and wolf-dog, which were investigated by the late Mr. Youatt),

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present a more or less sharply serrated or jagged surface, while hairs present merely an imbricated appearance. This characteristic of wool is shown in fig. 3, where *a* represents a fibre of merino wool, viewed as a transparent, and *b* as an opaque object. 'Hairs of a negro, of a mulatto, of Europeans, and of some Abyssinians, sent to me (says Dr. Prichard) by M. d'Abbadie, the celebrated traveller, were, together with the wool of a southdown sheep, viewed both as transparent and opaque bodies. The filament of wool had a very rough and irregular surface; the filament of negro's hair, which was extremely unlike that of wool and of all the other varieties mentioned, had the appearance of a cylinder, and the coloring matter was apparently much more

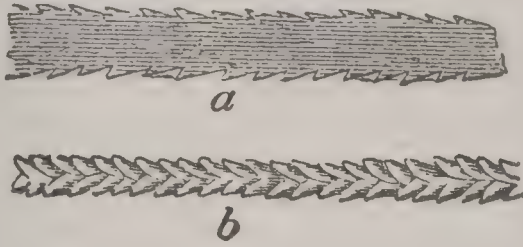


Fig. 3.
Fibre of Wool.

abundant than in the others.' It is in consequence of the above named difference between hair and wool that, though the former will entangle to a certain degree, it will not felt into a compact mass, which is the characteristic property of good wool.

The grayness of hair in advanced life results from a deficient secretion of pigment. Well-authenticated cases are on record in which the hair has grown gray or white in a single night, from the influence of fear, distress, or any variety of strong mental excitement. It is not easy to explain this phenomenon. Vauquelin suggested that it might result from the secretion at the bulb of some fluid (perhaps an acid), which percolates the hair, and chemically destroys the coloring matter.

The chief use of the hair, and particularly of the fur of various mammals which is especially developed in the winter, is to protect the body from external cold. Except on the scalp, and on the throat, this cannot be considered as applying to man. What, then, are the uses of the hair on the face, and especially on the upper lip? We answer this question with an extract from an article 'On the Use of the Hair' in *The Lancet* 1860, Nov. 3: 'Mr. Chadwick, who has done so much for sanitary reform, tells us that he was once very much struck by seeing some blacksmiths who wore beards, with their mustaches discolored by a quantity of iron dust which had accumulated among the hairs. Turning it over in his mind, it struck him that had not the dust been so arrested by a natural respirator, it must have found its way into the lungs, where it could not have been otherwise than productive of evil consequences. He hence rightly advised that the razor should be discarded by laborers in all dusty trades—such as millers, bakers, masons,

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etc.; by workmen employed in grinding iron or steel; and by travellers on dusty roads. In hot, sandy countries, the use of the beard is soon discovered; and travellers in Syria and Egypt find it necessary to defend their mouths against the entrance of the hot air of the desert. But not against dust alone is the facial hair a protection; it is the best barrier against cold air, biting winds, and wheezy fogs that a Northman can obtain. . . . According to Mr. Chadwick, the sappers and miners of the French army, who are remarkable for the size and beauty of their beards, enjoy a special immunity against bronchial affections.' In corroboration of the last named fact, we may mention another of a still more striking character. During the long continued search for Franklin's expedition, a transport vessel, the *North Star*, was frozen up during one of the severest arctic winters on record, in Wolstenholme Sound. The crew maintained their health perfectly during all the trials to which they were exposed. On their return to England in the early summer, they shaved off the hair that had been growing around the mouth and throat for the last eight or nine months, and within a week *every man* was on the sick list with some form of bronchial or pulmonary disorder.

The length to which the hair of the head may grow normally, especially in women, is very considerable. In the 'Hair Court' of the International Exhibition (1862), there was a beautiful specimen of jet-black hair (British, we believe) measuring 74 inches.

Cases occasionally occur where there is an abnormal abundance of hair of considerable length in women, on parts where the hair is usually little more than down. A hairy woman, named Julia Pastrana, supposed to be a Mexican, was some years ago exhibited in London. Her embalmed body also was exhibited in that city 1862, and we extract the following remarks from a memoir on her in *The Lancet* for May 3 of that year: 'The ears, and all parts of the face except the eyes, were covered with hair of different lengths. The beard was tolerably thick, the hairs composing it being straight, black, and bristly, the part of it which grew on the sides of the chin hanging down like two plaits . . . The upper portion of the back of the neck and the hinder surface of the ears, were covered with hairs. On the shoulders and legs, the hairs were as abundant as they are occasionally seen on very powerful men.'

Dr. Chowne described similar but less marked cases of hairy women in *The Lancet*, 1843.

HAIR-DRESSING: one of the operations of the toilet. As a matter of convenience, as well as of taste and fashion, the dressing of the hair has received much attention in all civilized nations, ancient and modern. The growth of hair on the sides and lower part of the male face has caused some perplexity in management, and as a method of overcoming the difficulty, shaving has been resorted to, though at the sacrifice of what nature gives to distinguish the male from the female countenance, and also to protect the respiratory organs: *see* **BEARD**. The Jews, by their

HAIR-DRESSING.

scriptural law, were enjoined not to shave. The Romans shaved, and so did their immediate successors, the Romanized Britons. The Saxons and Danes did not shave, and wore long hair. The Normans shaved, but they, too, adopted long hair as a fashion; and from them, and the more modern French, the courtiers and cavaliers of the 17th c. adopted the practice of wearing those flowing 'love-locks' which excited the ire of the Puritans. It was, however, in the management of ladies' hair, that the



From Stewart's *Whole Art of Hair-dressing*, 1782.

art of the professional hair-dresser was in those times mainly exercised. In the 18th c., through the influence of French fashions, the dressing of hair, male and female, rose to a great pitch of extravagance and folly. The hair of a lady of fashion was frizzed up in convolutions and curls, decorated with ribbons, jewels, and feathers, and filled with pomatum and powder to a degree utterly monstrous. The adjoining figure represents one of those extraordinary head-dresses. As women of less exalted rank slavishly attempted to follow these absurdities, the business of dressing hair was extensively followed. The cost of a full dressing being, however, too high to be lightly incurred, often one dressing was made to suffice for a week or

fortnight, during which period such care was taken to preserve the greasy fabric undisturbed, that it became the resort of insects, and how to extinguish these odious pests was in itself a matter of serious concern. From pressure of business, it frequently happened that, previous to balls, ladies' hair had to be dressed one or two days in advance; and to keep the head-dress uninjured, the lady sat in a chair perhaps two nights, instead of going to bed. The writer of this has conversed with a lady who in this manner sat up one night for the sake of her finely powdered and frizzed-up hair. A taxation on hair-powder, with the simplification of fashions consequent on the French revolution, not only expelled hair-powder and perruques, but brought the profession of hair-dresser within reasonable bounds. As regards ladies' hair, fashion is constantly altering; at present the chignon, consisting of cushions at the back or top of the head, and covered with hair, has given way to a system of coils and plaits. With respect to men's hair, short cutting is now universal, and any indulgence in long hair behind is thought to mark a degree of slovenliness or whimsicality of fancy.

Innumerable are the oils, essences, and pomades which are vended for the hair, on the assumption that they improve and nourish it. According to the experience of the best perruquiers, all such applications, any unguent in particular, and however sanctioned by tradition, are injurious: if a

HAIR-DYE—HAIR-GRASS.

smoothing effect is necessary, a very little glycerine is preferable to oil or grease; it should be mixed with six to eight times its quantity of bay-rum or some similar liquid. In ordinary circumstances, regular but not violent brushing is preferable for maintaining cleanliness and glossiness. When the head becomes affected with scurf which the brush does not remove, let the following efficacious and simple method of purification be adopted. Beat up an egg, and rub it well in all over the head; then pour over it warm water, which, while removing the egg, will likewise carry away all the scurf; lastly, dry thoroughly with a cloth. The head may be held over a small tub during the process. After this, the hair will be very clean, and will take on a fine gloss with a brush. On no account use sharp combs to clean the head, for they are apt to irritate the roots of the hair, and after all fail in the desired object.

HAIR DYE: preparation for altering the color of the hair. Various means have been adopted for changing the natural color of the hair to a more favored one, and for hiding the approaches of age indicated by gray hairs. These usually consists in washing the hair with a solution of some metallic salt known to have the effect of darkening its color. These are the salts of oxides of silver, mercury, lead, and bismuth. The most perfect mode of dyeing the hair, however, is that of previously preparing it by a complete soaking with a solution of sulphide of potassium; the strength of this solution must depend on the depth of tint intended to be given; the stronger the solution, the darker the color will be. When thoroughly wetted, the hair is allowed to dry partially; and while still damp, it is to be again thoroughly wetted with a solution of nitrate of silver, also proportioned in strength by the same rule as in the case of the solution first applied. This make a very permanent dye, which requires renewing only as the new growth of hair becomes conspicuous. The fashion of dyeing the hair is very ancient, and belongs as much to savage as to civilized nations; but in the case of the former, vegetable dyes have been chiefly used; and the women of China and other eastern countries also resort to the same: the juice of the petals of *Hibiscus Trionum*, the Bladder-Ketmia, and probably other species of *Hibiscus*, are in general use with them.

The detection of stained hair is sometimes an object of medico-legal investigation. Lead may be detected by boiling the hair in dilute nitric acid, and then applying the tests for lead (q.v.) to the acid solution; while the presence of silver may be shown by digesting the hair in dilute hydrochloric acid or chlorine water, when the resulting chloride of silver may be dissolved out with a solution of ammonia, and submitted to the ordinary tests for silver (q.v.).

HAIR-GRASS: term applied in England to several varieties of native grass belonging to the genus *Aira*. Of these the principal are as follows: Water hair-grass (*A. aquatica*), growing in marshes, very sweet but not suitable for cultivation; Hassock-grass (*A. caespitosa*), a rank

HAIR MANUFACTURES.

grows in both wet and dry soils, forms large tufts or hassocks, very coarse and contains little nutritive matter; Crested hair-grass (*A. cristata*), sometimes classed in the genus *Poa*; it grows in dry warm soils, also to some extent in moist land: it is only moderately nutritious; Zig-zag hair-grass (*A. flexuosa*), fairly productive, especially in a deep soil: useful in improving land overrun with furze. Like all other grasses of this genus, it needs cutting early in the season.—In the United States H.-G. is known also as Fly-away grass and Tickle-grass. (*Agrostis scabra*), and is somewhat similar in appearance, though greatly inferior in quality, to the Redtop (*Agrostis vulgaris*) of the north which is known as Herd's-grass in Pennsylvania and the south. The panicles are large, loose, spread widely from the stalk, and have a marked purple tinge. Flowers appear early. The branches are long and hairy, when dry are very brittle, and the panicles are easily broken off and carried away by the wind. Thus the seeds are widely disseminated. It is very common in many western states, flourishes on uplands and in low fields that have been drained. It requires early cutting for hay. As it is a decidedly inferior variety of grass it should never be sown in mowings or pastures.

HAIR MANUFACTURES: Fabrics woven or felted of various kinds of hair; brushes made of particular kinds of hair; and ornamental hair-work.

Woven Fabrics.—The most important is the horse-hair cloth extensively used for covering the seats and backs of chairs, couches, and other articles of furniture; this is made of the long hair of horses' tails. As the hair is of such various colors, it is necessary to dye all the darker shades so as to produce a uniform glossy black; this is done by logwood and sulphate of iron (copperas) in the following manner: The hair must first be cleansed and deprived of its grease by soaking it in lime-water for a day; it is then transferred to the dye-vat, which is thus prepared for a hundredweight of hair. Sufficient water to fill a boiler large enough to receive the hair is boiled with 60 lbs. of cut logwood for three hours, after which it is suffered to cool, when 2 lbs. of copperas are added. This constitutes the bath, as it is called; and the hair, after being removed from the lime-water and well washed in soft-water, either rain or river, is immersed in it for 24 hours; it is then removed and again washed, to free it from the superfluous dye, dried, and shaken out ready for use. Perfectly white horse-hair can be dyed various colors, and is well adapted to receive the brighter ones: hence it has been much used of late years to produce ornamental hair-cloths which are in great request in some countries, especially in S. America. The weaving of horse hair cloth is different from that of other tissues, in consequence of the shortness of the hair, which, for the same reason, can be used only for the weft, except in the open or sieve cloth, which is made only in small squares for the sieve makers. Each hair has to be worked singly, and the loom requires two persons to work it. The warp used is either worsted, cotton, or linen yarn,

HAIR MANUFACTURES.

generally the last. The hairs for the web are kept wet by the side of the weaver, and are handed to him one by one. He receives them on a kind of hook at the end of his shuttle, the hook catching a knot tied by the attendant child who hands the hair. In other respects, the weaving differs little in its general character from that ordinarily employed for other fabrics. When the web is completed, it is dressed by calendering, which gives it a smooth and glossy surface. It is to be regretted that the popular taste does not turn to the ornamental kinds, which are not only very beautiful, but are durable and easily cleaned. The true crinoline cloth, for ladies' dresses, etc., was at first made of horse-hair, usually white; but the immense demand led to the introduction of agave or aloe fibre, which soon supplanted it for most purposes, except the manufacture of bonnets, for which horse-hair is largely used, both as material for the body of the bonnet, and as trimming. The trade in crinoline trimming in Switzerland and France is large, and considerable quantities are exported. Horse-hair is twisted into thick yarn, and woven into sacking in the ordinary way, in Anatolia and Roumelia; and cow-hair is worked into a rough yarn, and is woven into carpets, in Germany, and, in Norway, is made into socks by the peasants. Pig's hair is similarly employed in China; and among the natives of the Hudson's Bay territories, dog's hair is used for the same purpose. The goat's hair of Tibet and Persia, and the camel's hair used in weaving, belong rather to the true wools: see WOOL.

The difference between hair and wool depends chiefly on the greater or less smoothness of the surface of each fibre: hence the hairs which are smoothest cannot easily be felted; for if brought into contact they have no projections of the surface to keep them from slipping away from each other; but some of the hairs proper, by a little preparation, may be so roughened as to fit them for felting. Thus, coney wool, or the hair of rabbits and hares, if properly moistened with a solution of nitrate of mercury, loses its straight and smooth character in drying, and is then readily felted.

The shorter kinds of horse-hair from the manes and tails, also cow-hair and the softer kinds of pig-hair, are twisted into ropes, which, after being boiled and then thoroughly dried in an oven, are pulled to pieces. The hair retains the twist given it, and is then used for stuffing seats of chairs, etc.

Brushes of hair are of various kinds; some are made of the stiff hairs from the backs of pigs, and others are made of the soft hairs of the camel and other animals. The hairs for the first kind are called bristles (see BRISTLES), which constitute an important trade with various countries. They are used chiefly in the manufacture of hair brushes, clothes brushes, tooth and nail brushes, house-sweeping brooms, the larger kinds of painters' brushes, etc. The second kind are used chiefly in the manufacture of the fine brushes or hair-pencils used by painters and artists. The best bristles come from Russia. Hairs are yielded for this purpose, not only by the camel, but also by the badger, sable, goat, dog,

HAIR MANUFACTURES.

etc. In both cases, the sorting of the hairs into lengths is very important and troublesome. Generally, it is done by placing the hairs in small boxes (with the tips upward), sufficiently deep to keep them upright; and the sorter then, with nice eye and hand, selects the sizes, by pulling out all the longest, as they overtop the others; then the next size, and so on. This, in the case of the hairs for artists' pencils, is an extremely difficult operation, as great exactness is necessary. Several attempts have been made, in Russia and in some other countries, to sort bristles by machinery, and one person has succeeded in doing so with a rude wooden machine; but the only really successful and available machine was invented (and exhibited, 1862) by W. S. Yates, of Leeds, England: this machine sorts into ten sizes, with great rapidity. Most hair brushes are required to have the bristles or hairs placed with great evenness, so as to form a flat surface outward; but in the case of those which are called artists' and painters' pencils, their value consists in having a fine point, so that the selection of the hairs to insure this is a work of difficulty. The first step is, after selecting a small quantity, to see that all the tips are in one direction; this is usually done in removing them from the skin, a pair of flat-bladed pincers being employed to hold each cut of hairs, whilst the knife or shears severs them from the skin. They are then placed in small, shallow tin boxes, with the tips upward; and the box being carefully shaken, and gently struck on the bottom until the hairs have completely arranged themselves in an upright position, they are then picked out, as before described. Each size is placed by itself; and the brushmaker, according to the kind of pencil he is making, takes the proper size, and separating a sufficient number, they are placed upright in another little tin box, but now with the root-end of the hairs uppermost, so as to insure the tips being perfectly even, which is further insured by gently tapping the box as before. Fine thread is then looped round the base of the little bundle of hairs, and securely tied: sometimes more than one ligature is thus made; and the brush then requires only its handle of quill or wood. Artists' pencils being of various sizes, and many extremely small, several kinds of quills are required. These are obtained from several birds, as the swan, goose, duck, fowl, pigeon, lapwing, and even such small ones as the lark and thrush. Previous to receiving the brush, the quills, besides being cut to the required lengths, have to be further prepared by soaking in water, to prevent them from splitting as the thick end of the brush is being pushed down from the wider to the narrower end. They also contract somewhat in drying, and consequently hold the brush very tightly.

Ornamental Hair-work consists chiefly of the human hair plaited into chains, guards, etc., or wrought into various other fanciful devices, as souvenirs, etc. Under this head come also those manufactures of the human hair which are required either to supply a personal deficiency, or to meet the demands of fashion. To the former class belong the wig, the front, and other imitations of the natural covering

HAIR-POWDER.

of the human head; and to the latter, a variety of contrivances, whose mysterious names are known only to barbers and ladies' maids, for the purpose of giving an appearance of greater abundance to the natural supply.

The wig, like all other portions of human attire, has undergone a great many variations in fashion. In the present day the great object is, in the first place, as far as possible, to imitate nature and deceive the eye; and, secondly, to produce wigs of extreme lightness—a full-sized peruke rarely being more than two or three ounces in weight. A full head of hair from a young woman's head will sometimes weigh five or six ounces. There are two heads of hair in the South Kensington Museum, which are in the raw state as imported, and weigh together $11\frac{1}{2}$ ounces.—Much of the hair used for such purposes is received through French dealers, who collect it from Holland and Germany, as well as from the various departments of France. The light colors are usually obtained from the former countries, and the dark shades from Brittany; not because these countries yield the finest heads of hair, but because the poverty of the people induces its sale, while the peculiar fashions of the country head-dresses render its loss of little consequence. It is stated that the peasants of France alone supply annually 20,000 lbs. of hair, of the value of \$200,000. Some hair is received through German dealers: it is usually of lighter shade than the French.

HAIR-POWDER: pure white powder, made from pulverized starch, scented with violet or some other perfume, and formerly much used for powdering over the head. The strange fashion of using hair-powder is said to have originated from some of the ballad-singers at the fair of St. Germain, in France, whitening their heads to render themselves more attractive. Introduced into Great Britain, the fashion became universal among the higher and middle classes, with women as well as men. To make the powder hold the hair was usually greased with pomade, and accordingly the fashion was extremely troublesome. An act of parliament fixed that the fine dust of which the powder was composed should be made from starch alone; and we learn from the *Gentleman's Magazine*, that 51 barbers were convicted before the commissioners of excise at London, 1746, Nov. 20, and fined £20 each, for having in their keeping hair-powder not made of starch, contrary to act of parliament; and on the 27th, 49 others were fined, for the like offense, in the same penalty. In 1795, a tax of a guinea was put on the use of hair powder, and at one time yielded £20,000 per annum, but it had the effect of causing hair-powder to fall into general disuse. The French revolution, which overturned so many institutions, contributed also to a return by the people of Europe to natural and unpowdered hair. When gentlemen first left off hair-powder with queues, they were considered very unfashionable; and the custom of having the hair cut short, now quite universal, was deemed vulgar. At the present day, in Europe, powder is used by some of the footmen of the nobility and higher ranks as part of their livery; and occasionally, at

HAIRS—HAJDUK.

public or private *bals costumés*, ladies and gentlemen still appear with their heads powdered. There is no longer a tax on hair-powder in Britain.

HAIRS, in Botany: filaments very different from the hair of animals, though there is sometimes considerable general resemblance, and the same purpose of protection from cold and from various atmospheric influences seem also to be sometimes served by them. They are produced by no special organ analogous to the bulbs from which the hairs of animals grow, but are composed of cellular tissue, arise from the epidermis, and are covered with extensions of the cuticle. Some hairs consist of a single elongated cell; some of several cells placed end to end. The gradations are quite indefinite between the most elongated hairs and the mere warts or rugosities which often appear on the surface of plants. In like manner, hairs in botany pass into *bristles* (*setæ*) and prickles (*aculei*), which are merely stronger and harder hairs; but spines or thorns are totally different, arising from the wood of the stem or branch. Hairs in botany are very often connected with *glands*, which are cells or clusters of cells, producing secretions; hairs often arise from glands, and then generally serve as ducts through which the secretion may pass; hairs also often bear glands at their apex. Stinging hairs, as in Nettles, *Loasas*, and some *Malpighias* (see these titles), are ducts with venom-secreting glands at their base. (See cuts p. 610.)

HAIRST, n. *hārst* [A.S. *herfest*; prov. Ger. *herfst*, harvest: Icel. *haust*, autumn (see **HARVEST**)]: in *Scot.*, the harvest, or harvest time.

HAIR-TAIL (*Trichiurus*): genus of acanthopterous fishes, which, on account of their compressed and very elongated form, have been classed in the Ribbon-fish family, but are otherwise allied to the mackerel, tunny, etc., and are therefore, in recent systematic works, referred to the family *Scomberidæ*. The dorsal fin extends along the whole back, and is spiny throughout; there are no ventral fins, no anal fin, and no tail fin, the tail ending in a single elongated filament. One species, the SILVERY H. (*T. lepturus*), sometimes called the Blade-fish, is found in the Atlantic Ocean, and has been cast on the shores of Britain, but is more common in warmer regions. It is called Sabre-fish in Cuba. It sometimes attains a length of 12 ft. Its flesh is good.—An E. Indian species, the SAVALA (*T. Savala*), is much esteemed for food, and commonly sold in the markets of India.

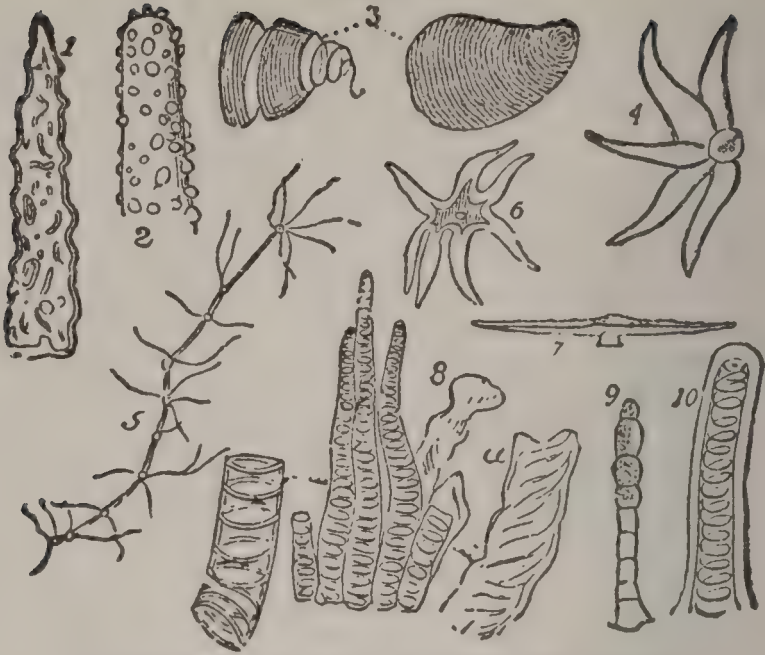
HAIRUM'BO: see **CACHAR**.

HAI'TI: see **HAYTI**.

HAIVERS, or **HIVERS**, n. plu. *hā'vērz*: in *Scot.*, foolish talk; incoherent speech; intelligence or statements unworthy of credit.

HAJDUK, or **HAI DUCK**, or corruptly, **HEYDUKE**, *hī'dūk* [Hungarian, *drover*, *cowherd*]: name of the population of a dist. in e. Hungary. The H. are direct descendants of those warriors, who, during the long and bloody contest between

HAIRS.



(Copied from the *Micrographic Dictionary*.)

Fig 1.—Hairs of Plants.

- 1, hair of *Delphinium Pinnatifidum*—magnified 200 diameters; 2, hair of *Anchusa Crispa*—200 diameters; 3, scale-like hairs from the seed of *Cobœa Scandens*—50 diameters; 4, stellate hair of ivy leaf—100 diameters; 5, branched hair of *Verbascum Thapsus*—25 diameters; 6, stellate hair of *Alyssum*—100 diameters; 7, horizontal stalked hair of *Grevillea Lithidophylla*—50 diameters; 8, annulated hairs from seed of *Ruellia Formosa*, in water—50 diameters; 8a, detached cell wall—200 diameters; 9, glandular hair of *Byronia Alba*—50 diameters; 10, hair from the seed of a *Salvia*—50 diameters.

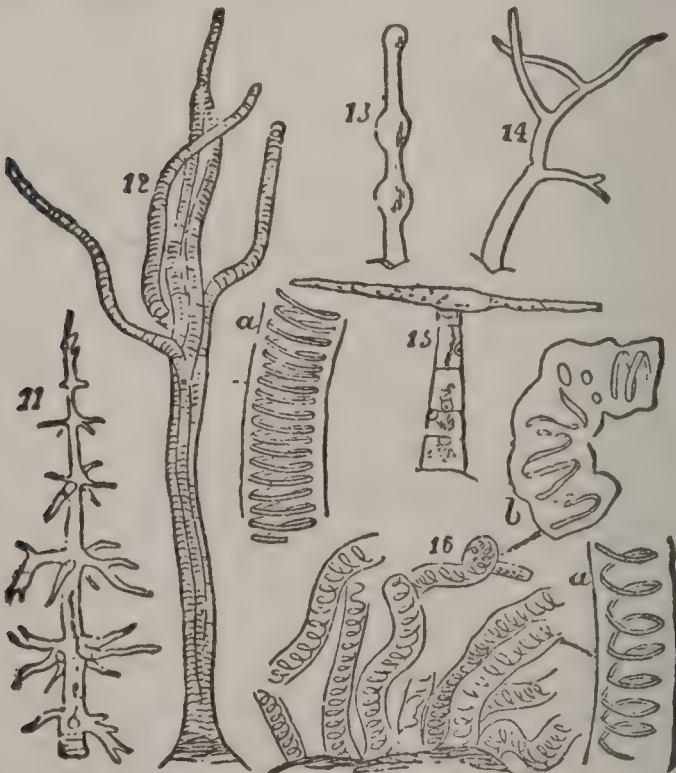


Fig. 2.—Hairs of Plants.

- 11, branched hair of *Alternanthera Axillaris*—100 diameters; 12, hair from the seed of *Acanthodium Spicatum*—50 diameters; a, fragment of a branch—200 diameters; 13, hair from the corolla of *Antirrhinum Majus*—50 diameters; 14, branched hair from epidermis of *Sisymbrium Sophia*—50 diameters; 15, T-shaped hair of garden *Chrysanthemum*—50 diameters; 16, spiral fibrous hairs from seed of *Collomia Grandiflora*, in water—50 diameters; a and b, fragments showing the cell wall and free fibre.

HAJILIJ—HAJJ.

the House of Hapsburg and the Prot. insurgents of Hungary, formed the nucleus of Prince Stephen Bocskay's valiant armies. The H. enjoyed privileges of nobility, and immunities from taxation ever since 1605, in which year the whole tract of land which is their possession to the present day was given them by the above-named munificent prince. Notwithstanding repeated attempts made by the Austrian government against their privileges, the H. retained the peculiar organization of their district, until after the disastrous struggle of 1848-49, when they were reduced to the same level with the so-called hereditary provinces of the empire. At the dawn of the Reformation, the H. were among the first to adopt Calvin's doctrines (designated during a long period 'the Hungarian faith,' in opposition to Luther, whose followers were chiefly among the Slaves of Upper Hungary). The H. are almost exclusively occupied in agriculture. In 1876, the country of the H. was incorporated with portions of two adjoining district, and formed into a new administrative division called *Haiduken-comitat*, with Debreczin as capital. See DEBRECZIN.

HAJILIJ, *hāj'ī-līj*, or BITO-TREE, *bē'tō-trē* (*Balanites Ægyptiaca*): tree of nat. ord. *Amyridaceæ*, native of Egypt and of central Africa; cultivated for its fruit, a drupe, which is edible, and from the seeds of which a fixed oil is expressed, called *Zachun*. So much is this tree valued in central Africa, that there is a common proverb to the effect that a milch cow and a bito-tree are the same. (Barth's *Travels*.)

HAJJ, *hāj* (whence HADJI, or HAJI, *hāj'ē*, or HAGGE), [(Heb. *Hag*, one of the three festivals appointed to the Jews for the purpose of pilgrimage to Jerusalem); Arab. pilgrimage]: emphatically, pilgrimage to the Kaaba (q.v.) or the temple of Mecca which every Mohammedan, male or female, whose means and health permit, is bound to perform, at least once in his life, otherwise, 'he or she might as well die a Jew or a Christian.' Mohammed, after many fruitless attempts to abolish altogether the old custom of pilgrimage—prevalent among most peoples in ancient, and some in modern times, perhaps arising from an innate travelling propensity, but not unfrequently fraught with mischievous consequences—was compelled finally to confirm it, only taking care to annul its idolatrous rites, and to destroy the great number of ancient idols around Mecca. The 12th month of the Mohammedan year, the Dsul Hajjeh, is the time fixed for the celebration of the solemnities; and the pilgrims have to set out for their journey one or two months before (in Shawâl or Dhulkada), according to their respective distances. They assemble first at certain variously appointed places near Mecca, in the beginning of the holy month, and the commencement of the rites is made by the male pilgrims here first putting on the *lhrâm* or sacred habit, which consists of two woollen wrappers—one around their middle, the other around their shoulders; their head remains bare, and their slippers must neither

HAJJI KHALFA.

cover the heel nor the instep. It is enjoined that the pilgrims, while they wear this dress, should be particularly careful to bring their words and thoughts into harmony with the sanctity of the territory that they tread, a territory in which even the life of animals is to be held sacred from any attack. Arrived at Mecca, the pilgrims proceed at once to the temple, and begin the holy rites there by walking first quickly, then slowly, seven times round the Kaaba, starting from the corner where the black stone is fixed (Tawaf). This ceremony is followed by the Sai, or running, likewise performed first slowly, then quickly, between the two mounts Safâ and Merwa, where, before Mohammed's time, the two idols Asaf and Nayelah had been worshipped. The next rite takes place on the ninth of the Dhulhajja, and consists in the Wukuf or standing in prayer on the mountain of Arafat, near Mecca, till sunset. The whole of the succeeding night is spent in holy devotions at Mogdalifa, between Arafat and Mina. The next morning, by daybreak, the pilgrims visit the Masher-al-Haram, the sacred monument (a place where, as legend relates, the Prophet stood so long in prayer that his face began to shine), and then proceed to the valley of Mirra, where they throw seven (or seventy) stones at three pillars, for the purpose of putting the devil to flight. The pilgrimage is completed with the slaughtering of the sacrifices on the same day and in the same place. The sacrifice over, they shave their heads and cut their nails, burying the latter on the same spot. They then take leave of the Kaaba, and, taking with them some sacred souvenirs, such as dust from the Prophet's tomb, water from the well Zemzem, etc., they proceed to their homes. The return of the holy caravans is watched everywhere with the most intense anxiety, and is celebrated with great pomp and rejoicings. Henceforth, the pilgrim never omits to prefix the proud name of Hajji to his name. It is permitted that those who, through bodily infirmity, are incapacitated from performing the holy journey themselves, may send a substitute, who acts as their representative in almost every respect, but this substitute has no share whatever in the merits and rewards belonging to the Hajj.

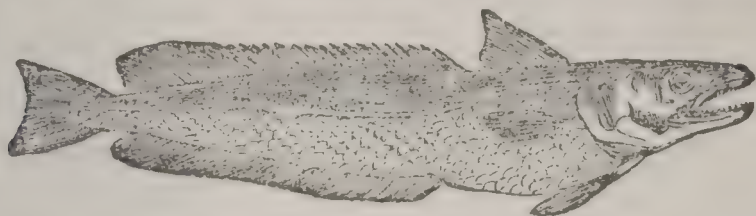
HAJJI KHALFA, *hâj'ê châlfa*, or HADJI KHALIFAH, *hâj'ê châl'i-fa*, surname of MUSTAFA-BEN ABDALLAH, KÂTIB CHELEPÎ: celebrated Turkish historian: abt. 1600-1658, Sep; b. Constantinople. He was employed in the Turkish army 1622-33, and had excellent opportunity for acquiring information regarding history, geography, etc., of which he eagerly availed himself. H.'s works are in Turkish, Arabic, and Persian. Besides a number of smaller works on geography and history, we have the celebrated *Asam al-kotoub ve al-fonoum* (Names of Books and Sciences), written in Arabic, and of which Flügel has given a translation with the text under the title *Lexicon Bibliographicum et Encyclopadicum a Mustafa-ben-Abdallah* (Leip., 1835-58, 7 vols.). There is also a French translation by Petis de la Croix (1694-1705), in ms. in the Imperial Library. In this work, H. gives a definition of each

HAKE—HAKIM.

science and the principal writers on each; specifies the titles, contents, language, dates of composition, and translations of more than 25,000 works; also the names of the authors and dates of their death. It is the most complete catalogue in existence of works in Arabic, Persian and Turkish. There is also *Turikh Kebir* (Great History), a history of the world from the creation of Adam to 1655, containing notices of 150 dynasties, principally Asiatic; also a history of the Ottoman empire 1591–1658; and a history of the maritime wars of the Turks, which has been translated into English (Lond. 1831).

HAKE, n. *hāk* [Norw. *hakefish*, a fish with a hooked under jaw—from *hake*, a hook: comp. Icel. *haka*, the chin, with reference to its peculiar under jaw]: an iron hook; a kind of sea-fish allied to the cod, so called from having a hook shaped jaw—see below.

HAKE (*Merluccius*): genus of fishes of the cod family (*Gadidae*), having a flattened head, an elongated body, two dorsal fins, of which the first is short and the second very



Hake (*Merluccius vulgaris*).

long, one very long anal fin, and the mouth destitute of barbels. The COMMON H (*M. vulgaris*), is found in the seas of n. Europe, and in the Mediterranean. It is sometimes three or four ft. in length; of whitish color, grayish on the back. It is very voracious, devouring great numbers of herrings and pilchards; hence it is frequently called the *Herring Hake*. It is coarse; its flesh white and flaky; but it is important as an article of human food and of commerce; being salted and dried in the same manner as cod and ling, in common with which it receives in this state the name *stock-fish*. It is generally taken by lines, like cod and ling. In the spawning season, when it keeps near the bottom, it is sometimes caught by trawl-nets. Other species of H are found in high southern latitudes, and a species closely allied, on the w. coast of S. America. The fish called H. in the United States, is the Forked Beard (*Physis furcatus* and *Raniceps trifurcatus*), a much better fish than the true hake.

HAKEMIFE, n. *hāk-ēm-īt*: relating to Hakem, a Fatimide caliph, who ruled in Egypt 993–1021; also, relating to astronomical tables published while he reigned. Some of these were constructed by Ebn Yunis, others by Abul-Wefa about 1000.

HAKIM, or **HAKEEM**, n. *hāk-ēm'* [Ar.]: in the *East*, a wise man; a physician.

HA KIM (in full, **EL HAKIM BI-AMRILLAH ABU 'ALEE MANSUR**): 985–1020: see **DRUSES**,

HAKIM BEN ALLAH—HAKLUYT.

HAKIM BEN ALLAH, *há-kím bèn ál'la*, or **BEN HASHEM**, *bèn há'shēm*, or 'ATA, *át'á*, called Al Mokanna (the Veiled), or Sagende Nah (Moon-maker): founder of an Arabic sect that appeared in the 8th c. during the reign of Mahadi, the third Abassidian caliph, at Neksheb, or Meru in Khorassan: died by suicide, 779-80. H. is said to have commenced his extraordinary career as a common soldier, but to have finally put himself at the head of a band of his own. In a fight, an arrow pierced one of his eyes, and in order to hide this deformity he henceforth constantly wore a veil, a habit attributed by other writers (Rhondemir, etc.) to a desire to conceal his extraordinary ugliness—by his own followers, however, to the necessity of shrouding the dazzling rays which issued from his divine countenance from the eye of the beholder. H. set himself up as God. He had first, he said, assumed the body of Adam, then that of Noah, and subsequently of many other wise and great men. The last human form he pretended to have adopted was that of Abu Moslem, a prince of Khorassan. Thabari sees in this idea of metempsychosis the Jewish notion of the Shekinah—the divinity resting on some one chosen person or place—and infers that H. may have been of Jewish origin. He appears to have been well versed in the art of legerdemain and 'natural magic,' principally as regards producing startling effects of light and color. Among other miracles, he for a whole week, to the delight and bewilderment of his soldiers, caused a brilliant moon or moons to issue from a deep well. H. found many adherents; and ere long he seized several fortified places near the cities of Neksheb and Kesh. Sultan Ma'adi marched against him, and utterly overthrew him. Some remnants of his sect still exist, distinguished by their white garb, in opposition to the black color adopted by the Abassidian caliphs. See **MOHAMMEDAN SECTS**. H. has furnished the subject of many romances, of which one in Moore's *Lalla Rookh* is most brilliant and best known.

HAKLUYT (or **HACKLUYT**), *hák'lót*, **RICHARD**, D.D.: English geographer: abt. 1553-1616, Nov. (not 1626 as by an error in the Abbey register); b. in or near London, of a Welsh family. While at Westminster School he eagerly perused narratives of voyages and travels, and continued this course at Christ-church, Oxford, whither he proceeded 1575. Being appointed lecturer on geography or cosmography in that university, he introduced the use of globes and other geographical appliances into English schools. Private individuals, as well as commercial companies and towns, consulted him respecting nautical enterprises. In 1584, he went as chaplain to the English embassy to Paris, where he printed at his own expense Lausonnière's manuscript narrative of the discovery of Florida printed first in French afterward in English. On his return to England with the assistance of Sir Walter Raleigh, he began to collect materials for the history of discoveries by his countrymen. He published the results in notices of more than 200 voyages, under the title *Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation* (Lond. 1589; new ed.,

HAKODADI—HAL.

3 vols. Lond. 1809-12). Government rewarded him with a prebend in Westminster Abbey, and a living in Suffolk. *A Selection of Curious, Rare, and Early Voyages and Histories of Interesting Discoveries*, etc., published chiefly by H., or at his suggestion, but not included in his celebrated compilation (4to, Lond. 1812), forms a supplement to the above works. He was buried in Westminster Abbey. H.'s unpublished manuscripts were made use of by Purchas in his *Pilgrims*.--An island in Baffin's Bay was named after him by Bylot, and a promontory in Spitzbergen by Hudson. The *Hakluyt Society*, instituted 1846, took its name from him: its object is the publication of all the histories of the earlier voyages and travels.

HAKODADI, *hâ-kô-dâ-dê*, or **HAKODATE**, *hâ-kô-dâ-tâ*: most northern of the open ports of Japan; $41^{\circ} 40'$ n. lat., and $141^{\circ} 15'$ e. long. The town stretches three m. along the base of a lofty promontory which juts into the strait of T'zagar, from the s. extremity of the island of Yesso. It is connected with the mainland by a low alluvial isthmus, and separated from the mountainous region to the n. by a plain bordered by an amphitheatre of hills. The adjacent scenery is striking and picturesque, closely resembling that of Gibraltar. H. was ceded to the Tycoon by the Prince of Matsumai 1854. It was then a poor fishing-village, but has now become a place of importance. The houses are of single story, fragile wooden buildings, with single roofs, retained in their places by cobble stones. Each house has on its roof a tub filled with water for use in case of fire. The streets are between 30 and 40 ft. wide, clean, well drained, and macadamized. In 1869, June, after the revolution, the Mikado's forces attacked H., which was occupied by the rebels, and a great part of the town was laid in ashes. Considering the latitude of H., its climate is severe, and during its winter season the thermometer has indicated 18° below zero. The observations of 1859 make its summer nearly correspond to that of Edinburgh. The snow disappears about the beginning of April (though it often lies on the mountains until mid-summer); and torrents of rain, brought up from the Pacific by the s.e. wind, quickly deluge the recently snow-denuded ground. H. is said not to be healthful, yet longevity is frequent. The harbor is one of the finest and largest in the world, but difficult of access; it is divided into an outer and inner harbor. By article three of the Treaty of Yedo (1858, Aug. 26), H. was, together with Kanagawa and Nagasaki, opened to foreign commerce 1859, July 1. It maintains commercial intercourse with all the large ports of Japan; a monthly steamer of the Pacific Mail runs to Yokohama. In 1869, the imports had a value of \$789,325; exports, \$990,710; but in 1871, they were much reduced. In 1881, the imports had a value of \$16,983, while exports were valued at \$843,628; and 1890 the imports were 5,080,220, and exports \$5,088,710. There is a large fluctuating population connected with the fisheries. Pop. (1889) 45,447; (1891) 52,909; (1898) 78,040.

HAL, *hâl*: town of Belgium, in S. Brabant, 10 m. from

HALACHA—HALAS.

Brussels. The beautiful Gothic church of **St. Mary**, dating from 14th c., is much resorted to by pilgrims on account of a black miracle-working wooden image of the Virgin. The town is on the Mons railway, and has some manufactures. Pop. abt. 8,000.

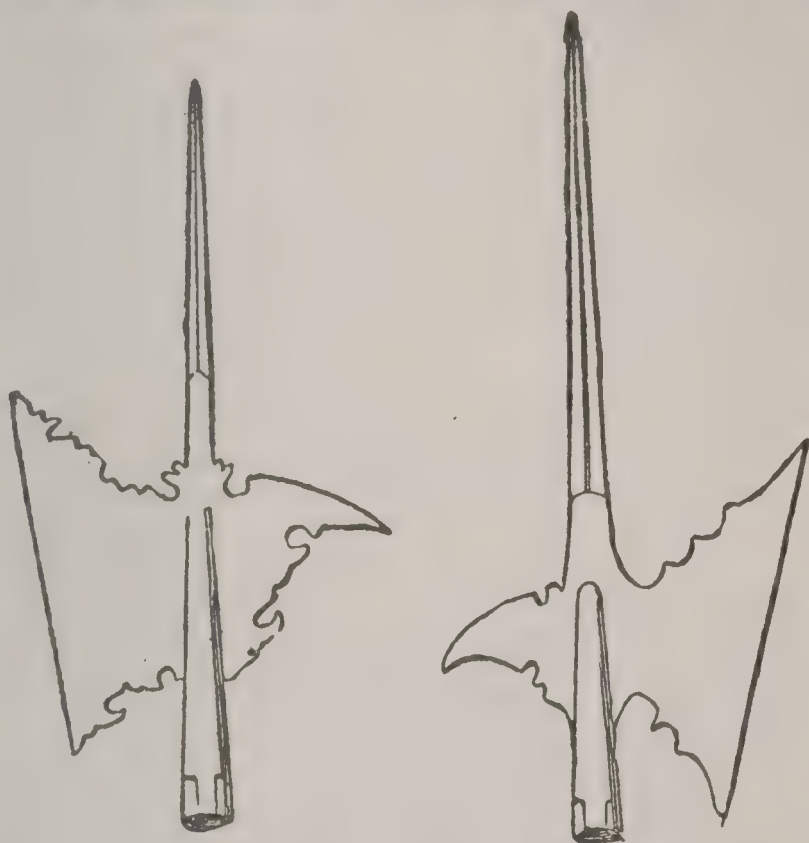
HALACHA, *hă'la-ka* or *ha-tă'ka* [Heb. Rule]: general term for the Jewish oral law, which runs parallel with the written law contained in the Bible, and is supposed by the Jews to be likewise of divine origin. Its relation to the ordinances contained in the Pentateuch is that of an amplified code to the fundamental, religious, and civil maxims—such as the changes wrought by time in the inner and outer relations of a rapidly increasing people would of necessity produce. Handed down through a long chain of highest authorities (Sinaitic revelation, Moses, Joshua, Elders, Great Synagogue [Ezra], etc.), it could only be treated and further developed by the foremost men of each generation—such, in fact, as through their eminence in learning belonged to a kind of aristocracy of mind (Chachamim, Wise Men), towering above the multitude (Hediotim, idiots). Their decision on all ordinances involved in contradictory traditions was final, because it was believed to spring from a deeper apprehension of Scripture. Often, indeed, they had recourse, to give their opinion greater weight, to certain special letters, words, and even signs in the Scripture, which, seemingly superfluous where they stood, were supposed to point to the injunction under discussion. H. embraces the whole field of juridico-political, religious, and practical life, down to its most minute and insignificant details. Originally, the Oral Law, by way of eminence, it began to be written down when the sufferings, to which the Jews were almost uninterruptedly subjected after the first exile, had made many portions of it already very uncertain and fluctuating, and threatened finally to obliterate it from memory. The first collection of laws was instituted by Hillel, Akiba, and Simon ben Gamaliel; but the final reduction of the general code, Mishna (q.v.), is due to Jehudah Hanassi, A.D. 220. Later additions to this code are formed by the Baraitas and Toseftas. Of an earlier date with respect to their contents, but committed to writing in later times, are the three books (Midrashim): Sifra or Thorath Kohanim (amplification of Leviticus), Sifri (of Numbers and Deuteronomy), and Mechilta (of a portion of Exodus). The masters of the Mishnaic period, after the Soferim, are the Thanaim. These were followed by the Amoraim, who, by discussing and further amplifying the Mishna, became the authors of the Gemara (q.v.), a work extant in two redactions—that of Palestine and of Babylon. The H. was further developed in subsequent centuries by the Saboraim, Geonim, and the authorities of each generation. See also MIDRASH: MISHNA: TALMUD.

HALAS, *hăh'łôsh'*: town of Hungary, dist. of Little Cumania, on the lake of Halastó, about 80 m. s.s.e. of Pesth. The people are employed chiefly in agriculture and cultivation of the vine. Pop. (1880) 15,039.

HALATION—HALBERD.

HALATION, n. *hā-lā'shŭn*: in *phot.*, an appearance, *etc.* of a halo of light, surrounding the edge of a dark object in a photographic picture developed upon iodide of silver; it causes a disagreeable hardness of outline.

HALBERD, or **HAL'BERT**, n. *hāl'bêrd* or *-bêrt*, also **HAL-BART** [Ger. *hellebarde*, a kind of spear: OF. *halebarde*, a halberd—from Swiss, *halm*, the handle of an ax (some say Ger. *hild*, battle), and O.H.G. *parten*; Ger. *barte*, a broad ax]: weapon borne in the British army till the close of the 18th c., by all sergeants of foot, artillery, and marines, and by companies of halberdiers in the various regiments. It consisted of a strong wooden shaft about 6 ft. in length, surmounted by an instrument much resembling a bill-hook, constructed alike for cutting and thrusting—a sort of battle-ax—with a cross-piece of steel, less sharp, for the purpose of pushing; one end of this cross-piece was turned down as a hook, for use in tearing down works against which an attack is made. The invention of the halberd is claimed by the Swiss and Danes; probably each produced



Ancient Halbert Heads.

something resembling it. The halberd appeared in England about the time of Henry VIII., and maintained its position more than two centuries. Now, it is rarely seen except on certain ceremonial occasions. **HAL'BERDIER'**, n. *-dîr'*, one who carries a halberd. **TIED TO THE HALBERTS**, strapped up to crossed halberts or beams to be punished by flogging; said metaphorically of a man put up for any kind of social punishment where he cannot help himself, or where resistance is vain—as a work adversely criticised and ridiculed whose author has nothing to say in his own defense.

HALBERSTADT—HALDANE.

HALBERSTADT, *hăl'bër-stăt*: ancient and quiet town of Prussian Saxony, govt. of Magdeburg, 30 m. s.w. of the city of Magdeburg; amid fruitful plains on the Holzemme, tributary of the Saal. It is well built; its streets mostly are long, broad, and moderately straight; and among its notable buildings are the Church of Our Lady (1005-1284), in Byzantine style; and the cathedral, an elegantly proportioned Gothic edifice, begun in the middle of the 13th c., and dedicated to St. Stephen. H. has two good libraries, and numerous collections of paintings, coins, and antiquities, which, with the Poetical Society (*Dichterverein*), formed by the poet Gleim, have maintained here a lively appreciation for the arts and sciences. The manufactures are woolen and cotton fabrics leather, soap, gloves, tobacco, and cigars; brewing and oil-refining are carried on extensively. Pop. (1880) 31,260; (1885) 34,037.

HALCYON, n. *hăl'si-ön* [*L. halcyon*, or *alcyon*; *Gr. hal-küōn*, the kingfisher, halcyon]: a name formerly given to the bird kingfisher (q.v.), said to lay its eggs near the sea during calm weather; a bird fabled to incubate on the sea, and which so brought about calm weather: **ADJ.** calm; quiet; undisturbed; peaceful. **HALCYON DAYS**, the name given by the ancients to the seven days which precede and the seven which follow the winter solstice, from the supposed circumstance of the *halcyon* selecting that period for incubation; days of peace and tranquillity. **HALCYONIDÆ**: see **KINGFISHER**. **HALCYORNIS**, n. *hăl si-ör'nīs* [*Gr. ornīs*, a bird]: in *geol.*, an extinct bird whose remains occur in the eocene Tertiaries.

HALDANE, *hăl'dān*, **JAMES ALEXANDER**: 1768, July 14—1851, Feb. 8; b. Dundee, Scotland; brother of Robert H. (q.v.). He was educated at Dundee and the High School and Univ. of Edinburgh, became a midshipman in the service of the E. India Company when 16 years old, and after 4 voyages to India was promoted master of the *Melville Castle* 1793. Before the ship sailed he experienced a religious change, and, determining to engage in missionary labor, he sold his commission and interest in the ship for \$60,000, and returned to Scotland. He made several tours of the country, distributing tracts and holding prayer, Bible, and preaching meetings, generally in the open air; joined his brother **ROBERT** and others in forming the Soc. for the Propagation of the Gospel at Home 1797, Dec.; spent two years organizing congregations through Scotland, for which his brother erected churches; was ordained pastor of a large congregation in Edinburgh as an Independent or Congregationalist 1799; avowed his change to Bapt. views 1808; and preached gratuitously to his Tabernacle congregation for more than 50 years. He published many controversial pamphlets the latest being *Doctrine of the Atonement* (1845), and *Exposition of the Epistle to the Galatians* (1848).

HALDANE, **ROBERT**: philanthropist: 1764, Feb. 28—1842, Dec. 12; b. London; brother of James Alexander H.

HALDEMAN.

He was educated in the Dundee Grammar School and the Edinburgh High School and Univ., and though heir to a large estate entered the royal navy 1780. He first served under his uncle Lord Duncan, commander of the *Monarch*, was transferred to the *Houdroyant* 1781, and distinguished himself in the engagement with the *Pegase*, took part in the relief of Gibraltar, resigned from the navy 1783, and settled on his estate of Airthrey 1785. In 1793 he became deeply interested in religion, and resolved to devote his life and means to the advancement of Christianity. In 1795 he sold a large part of his estate and began organizing a vast scheme of missionary labor in India for which he was to provide the total expense; but at the last moment he was compelled to abandon his project by the hostility of the E. India Company, which was suspicious of his motives. He then organized the Soc. for the Propagation of the Gospel at Home 1797. Dec., and as his brother gathered congregations in various parts of Scotland he used his money in building houses of worship, supporting missionaries, and founding and maintaining schools for the education of young men for the ministry. During the ensuing 12 years he is said to have expended more than \$350,000 in this work; and he was credited with having educated 300 ministers at an expense of \$100,000 during his lifetime. He was in Geneva 1816, and in Montauban 1817, lecturing with great success to theol. students in both cities; returned to Scotland 1819, and passed the latter part of his life in discussing the leading religious controversies of the day. Though he seceded from the established Presb. Church, and adopted many of the views of Robert Sandeman, he was strictly unsectarian in all his work. He published *Evidences and Authority of Divine Revelation* (1816), *Commentary on the Epistle to the Romans* (1819), *On the Inspiration of Scripture* (1828), and *Exposition of the Epistle to the Romans* (1835).

HALDEMAN, *haw' dè-man* SAMUEL STEHMAN, A.M., LL.D.: 1813, Aug. 12—1880, Sep. 10; b. Locust Grove, Penn.: naturalist. He received a classical and collegiate education but did not graduate, was asst. in the N. J. geological survey 1836, and in the Penn. 1837-42; prof. of natural sciences in the Univ. of Penn. 1851-55, similar prof. in Del. College 1855, prof. of geology and chemistry in the State Agricultural College of Penn., and prof. of comparative philology in the Univ. of Penn. from 1869 till his death. He published numerous works on conchology, entomology, and paleontology, and his *Analytic Orihography*, or investigations into the philosophy of language, obtained in England the highest Trevelyan prize over 18 competitors 1858.

HALE.

HALE, a. *hāl* [Goth. *hails*; AS. *hal*, sound, healthy: Icel. *heill*, whole]: sound of body; healthy; not impaired: N. in *OE.*, welfare. *Note.*—**WHOLE**, **HAIL** 2, and **HALE** 1 are identical.

HALE, v. *hāl*, or *hál* [F. *haler*, to haul, to tow: Dut. *halen*; Dan. *hale*, to draw, to pull (see **HAUL**)]: to drag by force; to drag violently. **HA'LING**, imp. **HALED**, pp. *hāld*.

HALE, *hāl*, **DAVID**: 1791, Apr. 25—1849, Jan. 25; b. Lisbon, Conn.: journalist. He received a public school education, removed to Boston 1809, unsuccessfully engaged in mercantile business, became associate editor of the *New York Journal of Commerce* 1827, and joint proprietor with Gerald Hallock 1828; advocated free-trade, the sub-treasury scheme, and the chief democratic measures of the day, purchased the Broadway Tabernacle, New York, for a Congl. church, since removed to Sixth Ave. and 34th St.; supported several missionaries, and contributed liberally to various religious and benevolent interests, especially of the Congl. churches.

HALE, **EDWARD EVERETT**, D.D.: Unitarian minister and author: b. Boston, 1822, Apr. 3. He graduated at Harvard College 1839, studied theol. and ecclesiastical history privately, was licensed to preach 1842, and after supplying various congregations was pastor of the Church of the Unity, Worcester, 1846-56, and was then called to the South Congl. (Unit.) Church, Boston, where he (1889) remains. During his ministerial career he has been active in social, educational, and philanthropic enterprises; organized the Harry Wadsworth Club, which has numerous branches in the United States and Europe, and the Look-up Legion among American Sunday-schools; edited *The Christian Examiner*, *The Sunday School Gazette*, *Old and New* 1869-75; and *Lend a Hand*, a *Journal of Organized Charity*; beside *Original Documents from the State Paper Office, London*, and the *British Museum, Illustrating the History of Sir W. Raleigh's First American Colony and the Colony of Jamestown* (1860), John Lingard's *History of England*, 13 vols., and many historical works, pamphlets, and papers; contributed largely to the periodical press; and attained wide popularity as a lecturer. To the rising generation he is best known as a writer of charming fiction and history. His publications in these lines include: *The Rosary* (1848), *Margaret Percival in America* (1850), *Sketches of Christian History* (1850), *Kansas and Nebraska* (1854), *My Double and How he Undid Me* (1859), *Ninety Days' Worth of Europe* (1861), *The Man Without a Country* (1863), *The Skeleton in the Closet* (1866), *If, Yes, and Perhaps* (1868), *The Ingham Papers* (1869), *His Level Best, and Other Stories* (1870), *Daily Bread, and Other Stories* (1870), *Ups and Downs* (1871), *Sybaris* (1871), *Christmas Eve and Christmas Day* (1874), *In His Name* (1874), *The Good Time Coming* (1875), *One Hundred Years* (1875), *Back to Back* (1877), *What Career?* (1878), *Crusoe in New York* (1880), *Stories of War* (1880), *June to May* (1881), *Stories of the Sea* (1881), *Stories of Adventure* (1881), *Stories of Discovery* (1883), *Seven*

HALE.

Spanish Cities (1883), *Christmas in a Palace* (1884), *Stories of Invention* (1885), *Easter* (1886), *Franklin in France* (1887), and *The Life of Washington* (1887). He received his degree from Harvard Univ. 1879.

HALE, JOHN PARKER: 1806, Mar. 31—1873, Nov. 19; b. Rochester, N. H.; statesman. He graduated at Bowdoin College 1827, was admitted to the bar at Dover, N. H., 1830, elected a member of the legislature as a democrat 1832, appointed by Pres. Jackson U. S. dist. attor. 1834, re-appointed by Pres. Van Buren 1838, removed by Pres. Tyler 1841, elected representative in congress 1842, and U. S. senator 1846, 56, and 58, and appointed U. S. minister to Spain 1865. During his service in the lower house of congress he opposed the rule suppressing anti-slavery petitions, refused to support the scheme for the annexation of Tex., and was a member of the most important committees. In his 16 years of service in the senate he fought the slave power at every opportunity. He had oratorical gifts of high order, a clear, strong voice, a quick wit, and a large fund of humor, and impressed all hearers with a conviction of his deep sincerity. He declined the nomination of a National Liberty convention for pres., 1847 secured the abolition of flogging in the navy 1850, and of the spirit-ration 1862; was the free-soil party's candidate for pres., with George W. Julian for vice-pres., and received 157,685 votes 1852; and was one of the victims of the National Hotel poisoning, from the effects of which he never wholly recovered. Between his periods of public service he practiced his profession in Washington, New York, and his native state. One of his most notable engagements was as counsel in the exciting trials that grew out of the rescue of the fugitive slave Shadrack from the custody of the U. S. marshal at Boston 1851.

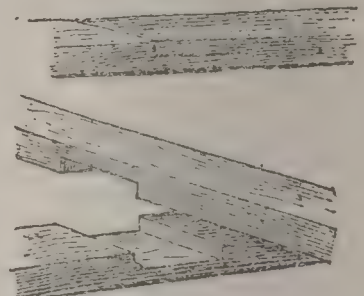
HALE, *hāl*, Sir MATTHEW, Lord Chief-Justice of England: 1609, Nov. 1—1676, Dec. 25; b. Alderley, Gloucestershire. In his fifth year, his parents died, and he was brought up by a kinsman of strict Puritan principles, and intended for the ministry. He was sent to Oxford Univ. at the age of 16, and was of studious disposition till a company of strolling-players visited that seat of learning, when the long pent-up passions of youth were suddenly let loose, and in this vagrant company he gave way to dissipation, and at last was about to enter the army. But just at that time he became involved in a litigation about his patrimonial estate, and went to London to consult Serjeant Glanvil, a leading lawyer. The serjeant turned young H.'s ambition into a new direction; and ultimately, 1629, H. entered the Society of Lincoln's Inn, and was in due course called to the bar. He had by that time renounced gay company, was a great student, and soon acquired considerable practice. When the long parliament began he had much repute; and having cautiously refrained from committing himself to either of the great parties, both sought to enlist him in their service. But he declared for neutrality—conduct which Lord Campbell pronounces cowardly and self-



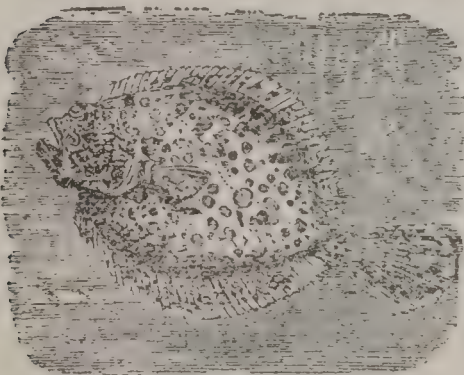
Halberds. — 1, Halberd (time of Henry VIII.); 2, Ditto, with fleur-de-lis (Henry VII.); 3, Double axed Halberd (Charles I.); 4, Halberd (Charles II.); 5, Ditto (William III.).



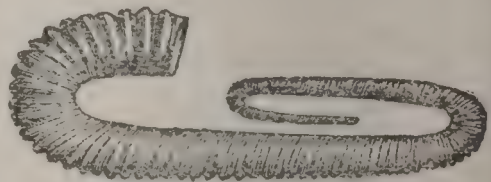
Hamadryas.



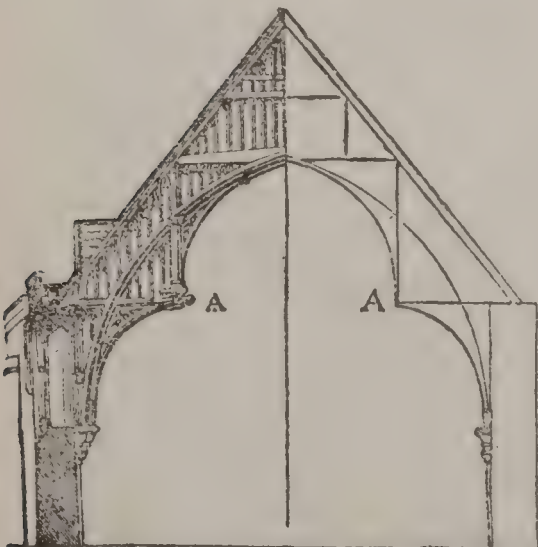
Halving, in joinery.



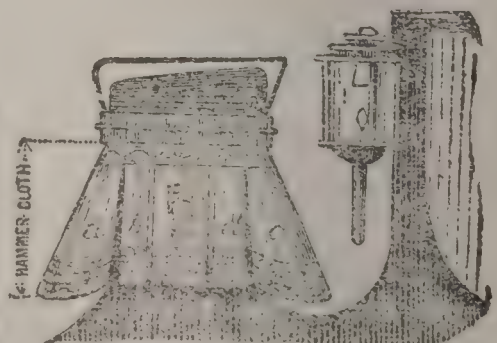
Halibut.



Hamite.



Hammer-beam Roof, Westminster Hall: A, A, Hammer-beam.



Hammer-cloth: a, a, Bells; b, c, Plaits.

HALE—HALES.

ish, but which is almost universally deemed to have been the result of a sincere desire for the public good, and the conscientious dictate of his estimation of the duty proper to a jurist. When, however, the parliament triumphed, H. signed the Solemn League and Covenant, and sat in the assembly of divines at Westminster, faithfully tried to bring about a settlement between the king and parliament, and failing, ultimately took his engagement to the Commonwealth, and was made a judge under Cromwell 1653, having overcome his natural scruples about serving a usurper, on the plea of necessity. The utterly irrational course of the king, and the evident sagacity and sincerity of Cromwell, may well have convinced him of the hopelessness at that time of any public benefit from the kingly government. He acted as a *puisne* judge of the common pleas till Cromwell's death, but refused to have his commission renewed by Richard Cromwell, and then entered parliament. On the restoration, he was graciously received by Charles II., and was made chief baron of the court of exchequer; and after 11 years, was transferred to the chief-justiceship of the court of queen's bench. He was reckoned the best judge of his time, being acute, learned, and sensible; and he ever set his face against bribery, one of the vices of the age. John Bunyan was brought before him, and convicted of frequenting conventicles; and when Bunyan's wife afterward moved for her husband's discharge, she was politely dismissed without redress. It is his reproach, which the unenlightened age must share with him, that he also sentenced some women, convicted of witchcraft, to be executed, avowing his full faith in the delusion of the best minds of that age, that witchcraft was a grave and dangerous offense. During his career as a judge, H. led an austere and scholarly life, leaning to the side of the Puritans. He made a friend of Richard Baxter, and was very serious and earnest in his religious views, and strictly pure in morals. His private diaries and papers show the elevation of his character. He wrote some legal works, which are still of the highest authority, and he bequeathed several valuable legal mss. to Lincoln's Inn, which are still treasured there. He resigned his office from ill health 1676, and died on Christmas-day of that year.

HALE, NATHAN: soldier and hero: 1755, June 6—1776, Sep. 22; b. Coventry, Conn. He rose from a volunteer in the revolutionary army to the rank of capt., and was commissioned by Washington to enter the British lines in New York and procure intelligence. This he successfully accomplished, but on his return was arrested and condemned to be hanged. The execution took place near the junction of East Broadway and Market st., in the orchard of Col. Henry Rutgers. His last words were: 'I only regret that I have but one life to lose for my country.'

HALES, ALEXANDER OF: see ALEXANDER OF HALES.

HALES, *hätz*, JOHN ('the ever-memorable Mr. John

HALES—HALÉVY.

Hales of Eton'), 1584-1656, May 19; b. Bath, England. He was educated at Corpus Christi College, becoming fellow of Merton and prof. of Greek at Oxford, and resident fellow of Eton. In 1618 he went to the Hague as chaplain to the British ambassador; and was present at the Synod of Dort to report proceedings. The unchristian passion and contentious zeal of extreme orthodoxy led him to see how little dogmatic precision has to do with spiritual truth, and how hopeless it is to confine this truth under definite creeds and systems of human device; and he 'bid John Calvin good-night.' He returned to England 1619, and settled at Eton in studious seclusion. His *Tract concerning Schism and Schismatics* brought him under the displeasure of Laud, who however was satisfied on a personal conference, and appointed him to a canonry at Windsor. During the Puritan supremacy he was driven from his office and reduced to great poverty. H.'s *Golden Remains* appeared 1659; the best ed. was published at Glasgow, 3 vols., 1750. As one of the *Latitudinarians* (q.v.), H. is discussed by Tulloch in his *Rational Theology* (1872).

HALES, STEPHEN: 1677, Sep. 7—1761, Jan. 4; b. Beckesbeurn, in Kent: English natural philosopher. He entered Bene't (now known as Corpus Christi) College, Cambridge, 1696; was elected fellow 1702, and having taken holy orders, was presented about 1710 to the perpetual curacy of Teddington, Middlesex, where the remainder of his life seems to have been spent.

His first important publication was *Vegetable Staticks, or an Account of some Statical Experiments on the Sap of Vegetables* (1727), which rapidly acquired such reputation as to be translated into English, French, Dutch, and Italian, and which may be considered the starting point of our true knowledge of vegetable physiology. A second part of this work, under the title *Hæmastaticks*, and treating of the circulation of the blood, appeared 1733. Besides independent works, he contributed numerous memoirs to the *Philosophical Transactions* on ventilation, on the methods of keeping water fresh, on electricity, on the analysis of the air, etc. His ventilating machines were introduced into the London prisons, and were found most efficacious in diminishing mortality among the prisoners. His system was adopted in France with similar good results. His improvements in the mode of collecting gases did much to facilitate the subsequent labors of Black, Priestley, and Lavoisier.

HALÉVY, á-lā-vě', JACQUES FRANÇOIS FROMENTAL: 1799, May 27—1862, Mar. 17; b. Paris, of Jewish parentage: French musical composer. He studied under Berton and Cherubini, and afterward at Rome. The first work that brought him any considerable reputation was *La Juive*, produced at the Grand Opéra 1835. The most important of his subsequent pieces (of a serious character) were—*La Reine de Chypre*, *Charles VI.*, *Le Juif Errant*, and *La Magicienne*. Those for the Opéra Comique are regarded as most successful; the principal are—*Les Mousquetaires*

HALF.

(probably his masterpiece), *L'Eclair*, and *Le Val d'Andorre*. He was a great favorite with his countrymen; but his style was so purely national, that, in spite of his great dramatic power, he did not have great celebrity out of France.

HALF, n. *hálf*, **HALVES**, n. plu. *hárvz* [Goth. *halbs*, half: Icel. *halfa*, a part, side: Sw. *half*, half: Swiss, *halb*, the side of a body]: one portion of a thing divided into two equal parts: **ADJ.** in an equal part or degree: **AD.** in part; equally: very much, as half-starved. **HALFNESS**, n. *hálf'nis*, the state of being divided in opinions; in a state of uncertainty or half-heartedness. **HALF-AND-HALF**, a mixture of porter and ale or beer, in about equal portions. **HALF-BOARDER**, only a day-boarder at a school. **HALF-BOUND**, having only the back and the corners of leather, as a book. **HALF-BLOOD**, relationship between persons born of either the same father or mother, but not of both: such persons are related through only one parent. When two persons have the same father, but not the same mother, they are called brothers or brother and sister consanguinean; when they have the same mother only, they are called brothers, etc., uterine. In the succession to real or landed property in England, the half blood relations by the father's side succeed after the full blood relations; and next but at a considerable interval, the half-blood relations by the mother's side. **HALF-BREED** or **-BRED**, of a mixed race; a mongrel; a race-horse not pure blooded. **HALF-BROTHER** or **SISTER**, related by one parent only. **HALF-CAP**, in *OE.*, a cap but partially put off or doffed. **HALF-CASTE**, a cross, as between a European and a Hindu. **HALF-COCK**, raised only half-way, as the hammer of a gun: **N.** the position of being half raised. **HALF CROWN**, the second highest in value of the British silver coins, in value thirty pence = a little more than 60 cents. **HALF-DEAD**, almost dead; very much exhausted. **HALF-FACED**, *fäst*, in *OE.*, showing only part of the face; small-faced—generally in contempt. **HALF FARTHING**, the smallest British copper coin, in value the eighth part of a penny—not now in circulation; a mite. **HALF-HOLIDAY**, half of a working day devoted to rest or amusement. **HALF-MEASURES**, not full and complete endeavors or steps to accomplish the end in view. **HALF-MOON**, the moon when half the disk appears illuminated; anything like it. **HALF-YEARLY**, twice in the year. **HALF-PART**, equal shares; halves. **HALF PENNY**, n. *há'pén-nĩ* or *há'f pen-nĩ*, a copper coin, the half of a penny. **HALF PIKE**, a boarding-pike used in ships. **HALF PRICE**, a reduced price of half the amount; a reduced charge for admission. **HALF-ROUND**, a semicircular molding. **HALF-SEAS-OVER**, half-drunk. **HALF-SOVEREIGN**, a British gold coin, second in value, equal to ten shillings. **HALF-STUFF**, in manufacturing anything, half-formed material; a partially prepared pulp in paper making. **HALF SWORD**, in *OE.*, a close fight with swords, as it were at the distance of half a sword-length. **HALF TINT**, an intermediate tint. **HALF-WAY**, midway; equidistant from the extremes. **HALF-WITTED**, *-wit'éd*, weak in intellect; silly.

HALFEN—HALF-WAY COVENANT.

HALFEN, a. *háf'n* [see **HALF**]: in *OE.*, wanting half the necessary qualities to form a complete thing. **HALFEN-DEAL**, in *OE.*, nearly half.

HALF-PAY: allowance in the British army and navy to commissioned officers not actively employed in the rank to which the half-pay has reference; it corresponds to the French *demi solde*, or pay of *non-activité*. It has long been a disputed point whether half-pay is given to officers as a retaining fee, to keep them at hand for the time when their service may be again required, or an award on account of services already rendered; but whatever the terms of the original grant, there can be little doubt that, under the present regulations, half-pay, except when distinctly named *retired* half-pay, is in the nature of a retaining fee. This allowance is on quite a different footing in the navy and army.

In the royal navy of Great Britain, officers are merely appointed to serve during the period in which a certain ship is in commission; when this expires, their employment ceases, and they revert to non-activity. As there are always many more naval officers than appointments for them to fill, a considerable number are at all times on the non effective list; these are placed on half-pay until again called to serve; the amount of such half-pay being usually about 60 per cent of the full pay of each grade. Half-pay is thus in the navy a recognized condition for all officers not immediately wanted afloat.

In the British army, the case is different; there, an officer, on joining, is posted to a particular regiment, with which, in theory, he is supposed to serve until removed from it on attaining the rank of general. Consequently, no fund like the naval half-pay list is in any degree admitted. Army half-pay is of two natures—*temporary* half-pay, and (so called) *permanent* half-pay. The former is limited to officers incapacitated by casual sickness, to those without occupation, in consequence of any reduction of the corps in which they were serving, and to those serving in certain staff appointments.

Permanent half-pay can be demanded by any officer who has served 25 years; it is also given to majors and lieutenant-colonels who, after serving five years with a regiment in those ranks, are not re-employed. The cost of half-pay is very great, and is likely to increase. The first grant of army half-pay was made 1698, by William III.

For arrangement of Half-pay, or reduced pay in the United States forces, see **UNITED STATES ARMY**: **UNITED STATES NAVY**.

HALF-WAY COVENANT: an ecclesiastical compromise prevailing in the New England churches, during the earlier part of the 18th c. After the Protestant reformation the strictest Puritans adopted the theory that the visible church on earth should consist only of regenerate persons, and consequently must seek to discern whether an applicant for admission is a true follower of Christ. This view was brought to New England by the first colonists, who taught,

HALIAETUS—HALIBURTON.

however, that a severe examination should be avoided, and that the weakest faith, if genuine, should be accepted as sufficient for admission to the church; because such a weak faith most needs the fellowship of the church that it may grow strong. The baptized children of church members, too, were recognized as being members, but not in full communion, which could be attained only on personal profession of repentance and faith. But these strict conditions soon became unpopular, the clergy being the chief advocates of more liberal terms. At length, while the principle of a regenerated membership was not abandoned, a compromise was effected by which baptized persons, orthodox in doctrinal belief and correct in life, upon making with the church a covenant which involved something less than a profession of repentance and faith and was therefore called 'the half-way covenant,' were allowed to have their children baptized and even to come themselves to the table of the Lord. The latter part of the change was effected chiefly through the influence of Mr. Solomon Stoddard, for many years the venerated pastor at Northampton, Mass. Believing that the Lord's Supper was instituted as a means of regeneration and that, consequently, the unregenerate who had a general sympathy with the church ought to partake of it, he drew up a short profession for such persons to make in order to be admitted to the communion. Though at first opposed, the plan gradually prevailed among the ministers and people of that region and elsewhere in New England. When Jonathan Edwards (q.v.), grandson of Mr. Stoddard, became his colleague and successor, he continued to practice the plan for 20 years; but becoming convinced that it was unscriptural he renounced it. This produced a violent commotion and, with other influences, effected the severance of his pastoral relation (1750). The great awakening which afterward occurred under the preaching of Edwards, Whitfield, and others, introducing a higher spiritual tone into the life of the church in New England, ultimately brought about the abandonment of the half-way covenant. A similar plan, based on somewhat different principles, was for a long time in use among Presbyterian churches.

HALIAETUS, n. *hál-ĭ-ā-ē-tūs* [Gr. *hals*, *halos*, the sea; *aetos*, *aetos*, an eagle]: sea-eagle, genus of *Falconidae*, subfamily *Aquilinae*. *H. leucocephalus* is the bald-eagle or the white-headed eagle, the chosen symbol of the United States.

HALIBURTON, *hāl'ĭ-bēr-ton*, THOMAS CHANDLER, D.C.L.: colonial ex-judge, author, and politician: 1796–1865. Aug.; b. Windsor, Nova Scotia; son of the Hon. Mr. Justice H. of Nova Scotia; descended from an ancient Scottish family. H. received his education at King's College, in Nova Scotia, afterward practiced as a barrister, and became a member of the house of assembly. He was raised to the bench of the common pleas of the colony 1829, and 1840 became judge of the supreme court. In 1850 he retired from the bench, and went to reside in England. In 1858 he received the degree D.C.L. from the Univ. of Oxford, and

HALIBUT—HALICARNASSUS.

1859 took his seat on the conservative benches of the house of commons as M.P. for Launceston, which he represented until his death. H. is best known as the author of *The Clockmaker, or Sayings and Doings of Samuel Slick of Slickville* (1837)—picturing 'Sam Slick' as a Yankee clockmaker and pedler, whose quaint drollery, unsophisticated wit, knowledge of human nature, and aptitude in the use of what he calls 'soft sawdër,' have given him a chance of immortality: a second series followed 1838, a third 1840. Subsequently the author brings 'Sam Slick' to England as an attaché of the U.S. legation, and is thus enabled to offer many shrewd and humorous observations on the aspects of British society, especially in regard to the upper classes and their pampered servants: this was followed by another series 1844. *Sam Slick* has been almost universally read in the United States, where its extravagances are keenly relished. It has had wide popularity in England, and has been translated into many continental languages. H. was author also of the *Letter-bag of the Great Western, Wise Saws and Modern Instances, Nature and Human Nature, Bubbles of Canada, Rule and Misrule of the English in America*, and *A History of Nova Scotia*. Judge H. attained a place and fame difficult to acquire at all times—that of a man of serious avocation, whose humor was nurtured in one country, and became naturalized, in another; for humor is the least exotic of the gifts of genius.

HALIBUT, n. *hāl'-i-būt* (in Britain sometimes HOLIBUT) [Dut. *heil-bot*—from *heil*, holy; *bot*, as in *bot-risch*, a flat-fish], (*Hippoglossus vulgaris*): one of the largest of flat fish (*Pleuronectida*); in form more elongated than the flounder or the turbot, the eyes on the right side, the upper surface smooth and covered with small, soft, oval scales, the color brown of different shades; the under surface perfectly smooth and white. The H., though esteemed for the table, is not to be compared in quality with turbot; its flesh is white and firm, but dry, and has little flavor. The name Holibut, Halibut, was given because the fish was deemed good eating for 'holy-days,' i.e., days appointed by the Church for abstinence from meat. The H. is more abundant in the north than in the south; and great numbers are taken by the Orkney fishermen. It is not found in the Baltic, but is plentiful on the coasts of Norway, Iceland, and Greenland; and large quantities are taken on the northern parts of the American Atlantic coast. It is of great value to the Greenlanders, who preserve it for winter use by cutting it into long slips and drying it in the air. Oil is obtained from it in considerable abundance. It attains a great size; specimens have been caught weighing nearly 500 pounds. Other species of the same genus occur in the seas of other parts of the world.

HALICARNASSUS, *hāl'-i-kār-nās'sus* (originally *Zephyria*): ancient Greek city, on the s w. coast of Asia Minor, on the Ceramic Gulf or Gulf of Cos; founded on a picturesque site by a colony from Træzene. It was one of the cities of the so-called Doric Hexapolis, from which con-

HALICORE—HALIDON HILL.

federacy, however, it was eventually excluded. H. was the largest and most powerful of the cities of Caria, and, by its situation and the inaccessible position of its citadel, was reputed a place of great strength; but the people, owing to the enervating influence of the climate, were weak and effeminate, and during the Persian conquests, readily yielded to the dominion of the conquerors. During this period (about B.C. 500), a domestic tyrant, Lygdamis, rose to supreme power, as a vassal of Persia; and under his descendants, the city, without forfeiting the Greek character or ceasing to cultivate the Greek literature and arts, remained faithful to the Persian interest. Artemisia, daughter and successor of Lygdamis, actually commanded a naval squadron in the fleet of Xerxes, at the battle of Salamis. Alexander the Great, provoked by the obstinacy with which the city held out against him, commanded that it should be destroyed by fire; but the inhabitants took refuge in the citadel, which successfully resisted his arms. The city was afterward rebuilt, but never recovered its ancient importance or prosperity. In the days of the Roman Empire, it had sunk into comparative political insignificance, its only title to consideration at that time being the celebrated Mausoleum, erected in memory of one of the rulers, named Mausolus, by his sister who had been also his wife and successor, Artemisia. H. was the birthplace of two of the most eminent Greek historians, Herodotus and Dionysius. The site is occupied by the modern Boudroum. For an account of the discovery of the ancient remains of the city, and of the disinterment of the Mausoleum, see MAUSOLEUM.

HALICORE: see DUGONG.

HALICTUS, n. *hal-ik-tis*: genus of solitary bees, family *Andrenidæ*; found both in America and Europe.

HALICZ, *há lich*: town of Austria, in the crownland of Galicia: on the Dniester, in a fruitful dist. in the administrative division of Stanislawow, about 14 m. n. of the town of Stanislawow. There are here a convent of the Minorites; a community of Jews of the sect of the Caraites, distinguished for industry and uprightness; and, on the ridge of a hill in the vicinity, the ruins of the once strongly fortified castle of H., which has frequently been the scene of bloody encounters. H., from which Galicia has derived its name, is the oldest town in that crownland. It was built in the 12th c., and its castle was the residence of the rulers of what was formerly the grand principality and kingdom of Halicz. Pop. (1880) 3,464.

HALIDOM, n. *hăl-î-dôm* [Icel. *heilagr-dómr* — from *heilagr*, holy: *dómr*, doom or judgment]: in *OE*, things of especial holiness; the relics of the saints on which oaths were formerly taken; holiness; sanctity; holy state—formerly much in use in England as an adjuration.

HALIDON HILL: about a mile n.w. of the town of Berwick, in the fork formed by the Whitadder and the Tweed; scene of a bloody conflict between the English and Scots, 1333, July 19. Edward III., having determined to

HALIEUTICS—HALIFAX.

support the claims of Edward Baliol to the crown of Scotland, advanced to the borders with a large army, and laid siege to Berwick, the governor of which promised to surrender July 20, if not previously relieved. On the 19th, the acting regent of Scotland, Archibald Douglas, Lord of Galloway, surnamed 'the Tyneman,' with a large force, came in sight of Berwick, and found the English drawn up on the n. side of Halidon Hill. Regardless of fatigue, the Scots immediately advanced to the attack, but, while crossing the morass which skirts the base of the hill, suffered severely from the English archers. They nevertheless struggled onward, and mounted the hill, when the English, charging in a compact body, threw them into irretrievable confusion. A total rout was the immediate result, and the English Cavalry and Irish auxiliaries committed prodigious slaughter among the fugitives; upward of 10,000 Scots (according to some authorities, 14,000) being left on the field, among whom were Douglas the regent, three of the Stuart family, the Earls of Ross, Sutherland, Menteith, Lennox, and Athole, and many others of the nobility. The English loss was comparatively small. The town of Berwick immediately surrendered, and Edward Baliol again for a short time was on the throne.

HALIEUTICS, n. *hă-lī-ū'tiks* [Gr. *halieutika*—from *halieus*, a fisherman]: treatise on fishes or the art of fishing; ichthyology.

HALIFAX, *hăl'ê-făks*: capital of Nova Scotia; on the s.e. or outer coast of the peninsula, lat 44° 39' n., and long. 63° 37' w. Though it was founded so late as 1749, yet so favorably was it situated that in 1750 it supplanted Annapolis as the seat of government. The harbor is one of the finest in the world. It is entered from the s., extends n. about 16 m., and terminates in a magnificent sheet of water called Bedford Basin; it is spacious enough for the entire navy of England, and offers all the year round easy access and safe anchorage to vessels of any size. The harbor has two entrances, separated by M'Nab's Island, of which the western only is navigable for vessels of large tonnage. H., with its suburbs, extends along the slope of a hill, and is over two miles in length, and about three-quarters of a mile in width. The streets are well laid out, at right angles; and handsome granite and free-stone have superseded wood. The dockyard, covering 14 acres, is one of the finest in the British colonies. The principal edifices are the Province Building (which contains the govt. offices), Dalhousie College, Government House, military hospital, Admiralty house, lunatic and blind asylums, provincial penitentiary, court-house, exchange, post-office, theatre, workhouse, jail, etc. H. contained (1889) 38 churches; 8 banks; 15 hotels; 3 public libraries; 17 daily, weekly, and monthly periodicals; several public reading-rooms; granite dry-dock, the largest in America, completed 1889, cost \$1,000,000, electrical plants for street lighting, street railways. Imports (1900) were \$6,051,250; and the exports \$6,758,403; assessed valuation of taxable property \$23,329,402, city debt \$3,073,590, including cost of water

HALIFAX.

supply and of school buildings. In 1902 shipping was represented as follows: vessels cleared and entered, foreign, 461 of 338,664 tons; British, 1,588 of 1,078,722 tons; total, 2,049 of 1,417,386 tons. H. is the seat of an Anglican bp., and a Rom. Cath. abp.; is an important military post and strongly defended, is the chief naval station of British N. America; is the principal e. terminus of Canadian railways; and is an important cable station. Pop. (1871) 29,582; (1881) 36,100; (1901) 40,832.

HALIFAX: thriving market-town, municipal and parliamentary borough of England, in the West Riding of Yorkshire, on the river Hebble, a feeder of the Calder, on the slope of an eminence; 43 m. s.w. of York. 217 m. n.n.-w. of London. It is almost surrounded by hills; its situation is pleasing, and its general appearance handsome; while its ample supply of water-power and of coal, its facilities for transport both by water and by leading lines of railway, and its position near many of the great towns of the north of England, contribute to its manufacturing and commercial importance. The ecclesiastical architecture of H. strikes every visitor. The parish church of St. John, restored 1879, and Trinity church, are fine specimens of Gothic; 'All Souls,' from designs by Sir G. G. Scott, is one of the best and most elaborate of all the churches of which he is the architect. The 'Square Church,' Congregational, was erected 1863. The town-hall, opened 1863, is very ornate. Other important buildings are the Piece Hall, erected 1779, for the reception and sale of manufactured goods, now used as a market for fish and vegetables; the assembly-rooms, Mechanics' Institute, and theatre. Among the numerous public and private educational institutions are the Heath Grammar School, founded 1585, and the Blue Coat School. The Crossley Orphan Home and School was built by the Crossley brothers at a cost of £46,000. H. has three parks—Savile, Shrogg's, and the People's Park, the last the gift of the late Sir F. Crossley. Crossley's carpet-works employ more than 3,000 hands. The manufactured goods, besides carpets, are chiefly shalloons, tammies, calamancos, duroys, everlastings, moreens, shags, serges, merinos, as well as baises, narrow and broad cloths, kersevimeres, and bombazins. Cotton fabrics, wool-cards, and paper are mftd. There is some trade in corn, in iron, chemicals, and mill-machinery, and in raising coal and slate. Pop. (1871) 65,510; (1881) 73,633; (1901) 104,997.

A barbarous old local law long ago discarded, known as the Halifax Gibbet Law, was enacted here at an early period of the woolen manufacture, for protection of manufacturers against the thievish propensities of their hands, who were in the habit of robbing their employers, by keeping to themselves a portion of the material which ought to have gone into the cloth, so that when manufactured, the fabric was of inferior weight and body. The Gibbet Law provided that all persons within a certain circuit, who had stolen property of or above the value of 13½d., were to be tried by the frithburghers within the liberty, and if found guilty, were handed over to the magistrates for pun-

HALIFAX.

ishment, and were put to death on the first market-day following by means of an instrument similar to the guillotine. The platform of stones on which the H. gibbet stood, and where executions took place, is still seen on the w. side of the town.

HALIFAX, CHARLES MONTAGUE, Earl of: poet and statesman: 1661, Apr. 16—1715, May 19; b. Horton, Northamptonshire, England; grandson of Henry, first Earl of Manchester, and nephew of the famous parliamentary general. He was educated at Westminster School and Trinity College, Cambridge. A laudatory poem on Charles II. first brought Montague into public notice. Two years later, appeared the parody on Dryden's *Hind and Panther*, entitled *The Town and Country Mouse*, of which he was joint author with Matthew Prior; but his poetry would hardly have made his name remembered in the 19th c. He almost disappeared from the field of literature after the appearance of his satire, save as the patron of Addison and other men of letters. He had intended to enter the priesthood, as it afforded a regular income, but tempted by the offer of a seat in the house of commons, he became member for Malden in the convention parliament, where he voted for the declaration that James II. had abdicated, and that the throne was thereby vacant. He retained his seat in William III.'s first parliament, and was appointed 1692 a commissioner of the treasury. Dec. 15 in that year he proposed, in the house of commons, to raise a million sterling by way of loan. William required money for his wars—the moneyed classes were tired of bubble companies, and knew not where to invest safely, and the landowners were weary of heavy taxation; so the National Debt was established. (See NATIONAL DEBT.) In the spring of 1694, money was again wanted, and Montague was ready to supply it. This time he did so by originating a national bank, for which a scheme had been laid before the govt. by William Paterson three years previously. The capital was to be £1,200,000, and the shareholders were to be called the Governor and Company of the Bank of England. The bill for this was ultimately passed; the result was immensely successful, and Montague became chancellor of the exchequer. His next work was the recoinage of 1695, which he carried out successfully, appointing Newton warden of the mint, and raising tax on windows to pay the expense, instead of the obnoxious impost called hearth-money. The interval between the last day on which the old money was receivable in payment of taxes, and the issue of the new coin, was, owing to the absence of a circulating medium, likely to cause much distress; but he obviated this by establishing exchequer bills bearing interest daily, and ranging in amount from £5 to £500. On Godolphin's resignation 1697, he became premier, but soon becoming unpopular, was obliged to bestow upon himself the auditorship of the exchequer, and resign his higher offices. Harley insisted on his withdrawal from the commons, and he became Baron Halifax, adopting a title which had just become extinct. He was impeached before the house of lords for

HALIFAX—HALIOGRAPHY.

breach of trust 1701, and again 1703, but the proceedings fell to the ground. During the whole of Anne's reign, H. remained out of office, but was active in promoting the union with Scotland and the Hanoverian succession. On the queen's death, he was naturally appointed a member of the council of regency, and on George I.'s arrival, became an earl and prime minister. His rule was ended by death, after nine months. H., though arrogant and mean and fond of display, was a consistent politician, and one of the greatest financiers of his time.

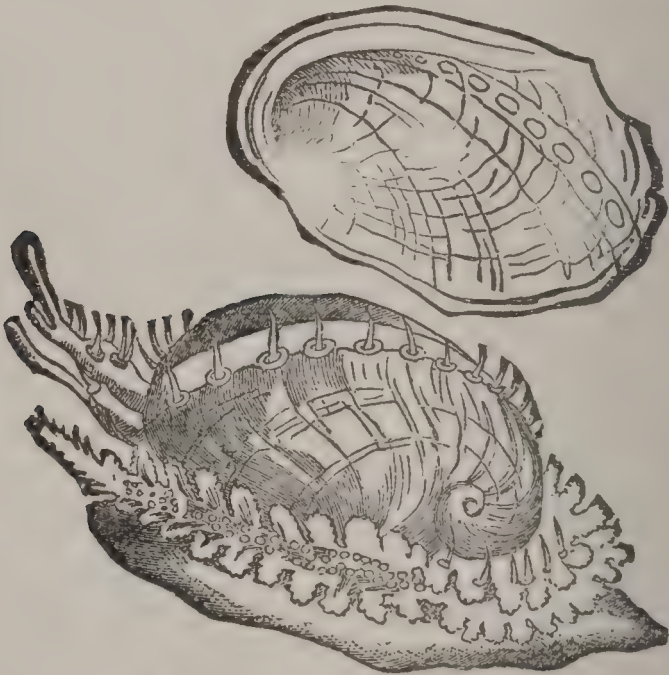
HALIFAX, *hāl-fāks*, GEORGE SAVILE, Marquis of: about 1630–1695, Apr. 20; b. Yorkshire, England: statesman. He was active in the Restoration, became Baron Savile and Viscount Halifax 1667, privy councilor 1672, member of the 'council of 30,' and earl 1679, and marquis of Halifax 1682. He was one of the 4 confidential advisers of Charles II., secured by his eloquence the rejection in the house of lords of the bill excluding the Duke of York from the succession 1680, defended Lord Russell, opposed the withdrawal of the Mass. charter, was appointed speaker of the house of lords, advocated the claims of William as king regnant, presented the crown to William and Mary on their accession, and became prime minister under them. On the accession of James he was transferred from the office of lord privy seal to that of pres. of the council, and on refusing to vote for the repeal either of the 'test' or the 'habeas corpus' acts was dismissed from the cabinet 1685. Subsequently he espoused the cause of William of Orange, was speaker of the house of lords in the 'convention parliament,' became lord privy seal under William, resigned his office and joined the opposition, and eventually returned to the support of the govt. He became leader of the party called 'trimmers,' and published many works, including *The Anatomy of an Equivalent*, *The Character of a Trimmer*, *Maxims of State Applicable to all Times*, *A Seasonable Address to both Houses of Parliament*, *Cautions for Choice of Parliament Men*, *Observations upon the Reigns of Edwards I., II., III., and Richard II.*, and *Character of King Charles the Second*.

HALIFAX RIVER: tidal channel in Volusia co., Fla.; known also as Mosquito North Lagoon. It communicates with the sea through Mosquito Inlet, extends 30 m. n. and inland with an average width of 1 m., is continuous southward with the Hillsborough river, is navigable, and abounds in oysters and fish.

HALIOGRAPHY, n. *hāl'ī-ōg'grā-fī* [Gr. *hals*, the sea; *graphō*, I write]: a description of the sea.

HALIOTIS.

HALIOTIS, *hāl-i-d'is* : genus of gasteropodous mollusks, type of a family, *Haliotidæ*; belonging to the order *Scutibranchiata*, and having a widely ear-shaped shell, with a very low spire, and a row of holes not far from the opposite margin, over the fissure of the mantle, through which the water gains access to the gill-cavity. The holes are closed as the animal grows, and new ones formed, which first appear as notches along the margin of the shell. The animal, in a living state, exhibits great beauty of colors. It adheres to rocks by a large muscular foot, after the manner of limpets. One species, *H. tuberculata*, is common on the s. European coasts. It is used for food; the shell also is sought for an ornament, and



Haliotis (tuberculata).

for the Nacre (q.v.) in which it abounds, which is much used for mother-of-pearl ornaments, and particularly for ornamenting papier-maché articles. The shells of this genus are called *Ear-shells* or *Sea Ears*. They are the *Ormers* of the French. The species are very numerous; the most splendid are natives of warm climates.

HALITE—HALL.

HALITE, n. *hā'lit*: name given by Dana to common salt.

HALITHERIUM, n. *hāl'î-thē'rî-üm* [Gr. *hals*, the sea; *thērîon*, a wild beast]: in *geol.*, a tertiary sirenian having evident affinities to the *sea-cows*.

HALITUS, n. *hāl'î-tūs* [L. *hālītus*, breath—fr. *hālō*, I breathe]: a breathing; the vapor from new-drawn blood.

HALL, n. *hawl* [AS. *heal*; Dut. *hal*; Icel. *hal* or *höll*, the principal building of a king's or great chieftain's dwelling: AS. *helan*, to conceal: It. *sala*; F. *salle*, a house, a residence—*lit.*, a cover or place of shelter]: a very large room for public assemblies, etc.; a large room at the entrance of a mansion-house or palace; a court-house; the name often given to the country residence of a nobleman or gentleman; the place of meeting and business of a corporation: in *English universities*, a small group of students, agreeing to live together in a hired house, under supervision by the univ. officials. Anciently the halls were very numerous; 500 were in Oxford when the colleges numbered but three. At the beginning of the 15th c., the halls had fallen to 55, and the endowed colleges had increased to 12. Now the halls are almost discarded: very few remain. The term, however, is applied to certain endowed colleges also. **HALL-MARK**, in *England*, the stamp affixed by the Goldsmiths' Co. (q.v.), and certain assay officers, to gold and silver articles, as a sign of their quality.—**SYN.** of 'hall': vestibule; court; entry; porch; passage; room; edifice; college.

HALL, *hāl*: small and very old town of Austria, in the Tyrol; on the left bank of the Inn, which is here navigable, six m. e. of Innsbruck. Its parish church, built 1271, with a monument that marks the grave of Spechbacher, bravest and most skilful leader of the Tyrolese in their struggle for independence; its gymnasium, its Franciscan convent, and its *Münzthurm*, are the chief buildings. About nine m. n. of the town is the Salzberg, with salt-mines, from which salt in the form of brine is conveyed to the pans of H. in wooden pipes. Although the demand is not so great as formerly, more than 300,000 cwts. of salt are still produced here annually. H. has also manufactures of sal-ammoniac and chemicals. Pop. (1880) 5,456.

HALL: large principal apartment of the castles and dwelling-houses of the middle ages. The hall is of very ancient origin. The earliest Saxon buildings on record are the palaces of the kings, and these seem to have consisted of one large hall, in which the king, his courtiers or 'hearth-men,' and all his retainers dwelt together, eating at the same table, and sitting round the same fire; and one other chamber, in which the king and his hearth-men slept, while his retainers slept in the hall. The Normans built their houses on the same plan—with the hall and one Solar (q.v.) or sleeping apartment. The same arrangement prevailed, with slight modifications, during the 12th and 13th c. In the 14th and 15th c., when the country was more settled

HALL.

and prosperous, and manners more refined, more numerous apartments became necessary. The hall, however, still retained its place as the chief apartment. In it the king or the lord of the manor gave audience, administered justice, received and entertained his retainers and guests, and performed all the public acts of feudal life.

At one end of the hall was a raised platform or dais, on which the table of the lord of the manor was placed, and where his more honored guests sat with him. The retainers sat at a table along the lower part of the hall. This part was not always in the cleanest and sweetest condition, and hence it received the name of 'the marsh.'



The Great Hall of Eltham Palace.

The hall partook of the style of architecture prevailing at the time when it was built, and being a large and important apartment, was generally ornamental in character. The roofs especially were very carefully and elegantly constructed, as many still remaining show. The hall of the king's palace, now called 'Westminster Hall,' built by

HALL.

William Rufus, and restored by Richard II., is the finest example in England, being 300 ft. long and 100 ft. broad. The great hall at Eltham is another fine example.

HALL, ANNA MARIA: novelist: 1802–1881, Jan. 30; b. Dublin; daughter of a gentleman named Fielding, who died when she was very young. In her 15th year she left Ireland with her mother, and went to reside in London, where her education was completed. In 1824 she married Samuel C. Hall (1800–1889, March 18; well-known for his works connected with the fine arts), and was thus led to become an authoress. Her first work, *Sketches of Irish Character* (1828), established her reputation. In 1832 she brought out her first novel, *The Buccaneer*, a story of the time of the Commonwealth, in which Cromwell's character is vindicated. Other works rapidly followed—*Tales of Woman's Trials* (1834); *The Outlaw*, a novel of the reign of James II. (1835); *The French Refugee*, a drama, which in 1836 was acted for about 50 nights at St. James's Theatre, London; *Uncle Horace*, 3 vols. (1837); *Lights and Shadows of Irish Character* (1838); *Marian, or a Young Maid's Trials* (1839); *The Whiteboy* (1845), etc. She was also the authoress of a graceful fairy tale of love, *Midsummer Eve*, and of a pleasant illustrated series of descriptive sketches, *Pilgrimages to English Shrines*.

HALL, ASAPH: an Ameri. astronomer; b. in Goshen, Conn., 1829, Oct. 15; was educated at Norfolk Academy and the University of Michigan; became assistant in the U. S. Naval Observatory at Washington 1862; prof. of mathematics in the navy 1863; had charge of several govt. astronomical expeditions; made numerous discoveries, the most important being that of the two remarkable satellites of Mars, which he named "Deimos" and "Phobos." In 1895 he became prof. of astronomy at Harvard University. He was vice-president of the National Academy of Sciences.

HALL, BASIL, Captain, R.N.. distinguished traveller: 1788, Dec. 31—1844, Sep. 11; b. Edinburgh; younger son of Sir James H. of Dunglass. He entered the navy 1802, and became post-capt. 1817. When Lord Amherst was sent on a mission to the court of Peking 1816, H. commanded the *Lyra*, which accompanied the expedition, and visited parts of the Korean coast, little known to Europeans. His book, *A Voyage of Discovery to the Western Coast of Corea*, etc. (Lond. 1818), excited much interest. Among H.'s works, are *Extracts from a Journal written on the Coast of Chili, Peru, and Mexico*, in 1820–22 (two of the earlier vols. of *Constable's Miscellany*); *Travels in N. America*, 3 vols. (violently assailed by the American press); *Fragments of Voyages and Travels* (three series, nine vols.), still very popular; and *Patchwork* (3 vols. 1841).

HALL, CHARLES CUTHBERT: an American clergyman; b. New York, 1852, Sept. 3; was graduated at Williams College, 1872; afterward studied theology at Union Theological Seminary and in London and Edinburgh; was ordained in the Presbyterian Church; held pastorates in Newburg, N. Y., 1875–77, and in Brooklyn, N. Y.,

1887-97; and became president of Union Theological Seminary in the latter year.

HALL, CHARLES FRANCIS: 1821-1871, Oct. 10; b. Rochester, N. H.: Arctic explorer. He received a common-school education, learned the blacksmith's trade, removed to Cincinnati and engaged in journalism and the stationery and engraving business, and becoming interested in the fate of Sir John Franklin spent 1850-60 studying the history of the Arctic regions and the experiences of the English search parties. In the winter of 1859-60 he proposed to the New York Geographical Soc. to head an expedition to search for the remains of Franklin and his companions and the records that he felt sure they had left. Through the active interest of Henry Grinnell (q. v.), the necessary funds were provided, and 1860, May 29, H. sailed from New London, Conn., on a whaling vessel, commanded by Capt. Sidney O. Buddington (d. 1888). The vessel becoming blocked in by the ice, H. left it, spent two years among the Esquimaux, and discovered relics of the Frobisher expedition of 1577-8. Returning to the United States 1862 he published *Arctic Researches and Life among the Esquimaux*, planned a second expedition and sailed again 1864, July 1. He returned in the summer of 1869 with undisputed relics of the Franklin party, and satisfied that none of Franklin's men could be living, but eager for an opportunity to extend geographical knowledge by penetrating the supposed open polar sea, 'An Expedition to the North Pole' was authorized by congress and fitted out by the navy dept., and 1871, July 3, H. started on his third arctic voyage from New London in the *Polaris*, in which he went as commander, Capt. Buddington as sailing-master, and Dr. Emil Bessels (d. 1888) as chief of scientific work, besides 24 others. On Aug. 29, the *Polaris* reached the highest point then attained by any vessel, 82° 16' n., and being laid up for the winter, H. started on a sledge journey, reached lat. 82° n., and returning to Thank God Harbor, Greenland, died suddenly of apoplexy. After much suffering the crew abandoned the vessel, and divided into two parties—one drifting on floating ice 195 days and being rescued 1873, Apr. 30, the other tossed in rudely constructed boats till picked up at sea 1873, June 23.

HALL, CHARLES HENRY, D.D.: Prot. Episc. clergyman: b. Augusta, Ga., 1820, Nov. 7. He graduated at Yale College 1842, studied theol. in the General Theol. Seminary, was ordained deacon 1844, and priest 1845, and after holding various pastorates became rector of Trinity Prot. Episc. Church, Brooklyn, 1869, where he staid till his death. He was chaplain of the 23d regt. N. G. S. N. Y., director in the Brooklyn Hist. Soc., and chairman of the standing committee of his diocese. Received his degree from Hobart College 1860, and Columbia College 1861; and was author of *Commentaries on the Gospels* (1867), *Protestant Ritualism* (1871), and *Spina Christi* (1883). D. 1895.

HALL, CHRISTOPHER WEBBER: an American educator; b. in Wardsboro, Vt., 1845, Feb. 28; was graduated at Middlebury College, 1871; afterward studied in Europe;

and became professor of geology and mineralogy in the University of Minnesota in 1878. He became president of the Minnesota Academy of Natural Science, 1888; was dean of the College of Engineering, Metallurgy, and Mechanic Arts, 1892-97; and was author of *Syllabus of Physical Geography*; *Syllabus of General Geology*, etc.

HALL, EDWIN HERBERT: an American educator; b. in Gorham, Me., 1855, Nov. 7; was graduated at Bowdoin College, 1875; studied physics at Johns Hopkins University 1877-81; was instructor of physics at Harvard University in 1881; assistant professor 1888-95; and became professor in the latter year. He was author of *A Text-book of Physics*; and of numerous articles in scientific and educational periodicals.

HALL, GRANVILLE STANLEY, PH.D.: educator: b. Ashfield, Mass., 1845, May 6. He graduated at Williams College 1867, studied theol. at Union Theol. Seminary, was prof. of English Literature and Philosophy at Antioch College, O., studied philosophy and the science of education two years in Berlin, two in Leipsic, one in Bonn, and one in Heidelberg, was lecturer at Harvard Univ. and Williams College 1876, 1881-2, was appointed prof. of psychology and pedagogies in Johns Hopkins Univ. 1882, and accepted the presidency of the new Clark Univ. at Worcester, Mass., 1888, May 1. He received the degree PH.D. from Harvard 1876; and has published *Aspects of German Culture* (1881), in conjunction with John M. Mansfield *Hints toward a Select and Descriptive Bibliography of Education* (1886), beside many important articles as editor of the *American Journal of Psychology*.

HALL, JAMES, LL.D.: paleontologist: 1811, Sept. 12—1898, Aug. 7. He graduated at the Troy (N. Y.) Polytechnic Institute 1833; was asst. prof. of chemistry and natural sciences there till 1836; became one of the state geologists of N. Y. 1837 and state paleontologist 1843; held the latter office till 1875; was appointed state geologist of Io. 1855 and Wis. 1857; director of the N. Y. State Museum 1866; was a founder of the International Congress of Geologist, 1876, and a vice-pres. at the sessions in Paris 1878, Bologna 1881, and Berlin 1885; and was elected corresponding member of the French Acad. of Sciences 1884. He was a founder of the American Assoc. of Geologists and Naturalists 1840 (parent of the Amer. Assoc. for the Adv. of Sci.), and pres. 1856; was elected one of the 50 foreign members of the Geological Soc. of London 1848, and received the Wollaston medal of the latter Soc. 1858, and the grand prize of \$1,000 of the Boston Soc. of Natural Hist. 1884. Besides his large works and special reports, he has published about 250 separate papers. He received the degree LL.D. from Hamilton College 1863, and McGill Univ. 1884.

HALL, JOHN, D.D., LL.D.: Presb. clergyman: b. co. Armagh, Ireland, 1829, July 31. He entered Belfast College when 13 years old, won the Hebrew prize several times, was licensed to preach 1849, became pastor of the First Presb. Church in Armagh 1852, and St. Mary's Abbey in Dublin 1858; received royal appointment as commissioner

HALL.

of education for Ireland; was delegate of the Presb. Church in Ireland to the Presb. churches in the United States 1867, was called to the pastorate of the Fifth Avenue Presb. Church, New York, and installed 1867, Nov. 3. His success in this field was so large that the congregation erected a \$1,000,000 church edifice 1875. He delivered the funeral sermon of Chief-Justice Chase 1873. He was elected chancellor of the Univ. of the City of New York 1882. Dr. H. has a great congregation with many parishioners of eminence; and is noted for his clear, direct, and simple style of preaching, and for his thorough Calvinism. He has published *Family Prayers for Four Weeks* (1868), *Papers for Home Reading* (1871), *Questions of the Day* (1873), *God's Word through Preaching* (1875), *Foundation-Stones for Young Builders* (1880), and *A Christian Home: How to Make and How to Maintain It* (1883).

HALL, JOSEPH, Bishop of Norwich, England: remarkable for learning, piety, and misfortunes: 1574, July 1—1656, Sep. 8; b. Ashby-de-la-Zouch, Leicestershire. He was educated at Emanuel College, Cambridge, of which he became a fellow. He became, 1617, Dean of Worcester, was one of the English deputies to the synod of Dort, was consecrated Bp. of Exeter 1627, and 1641 was translated to Norwich. The latter years of his life were saddened by persecution. He was accused first of Puritanism, though he zealously defended the Episcopacy. By attacking the Arminianism of Abp. Laud, he is said to have 'exposed himself to the malignant and wanton attacks of that primate and his crew.' In 1640, he wrote *Episcopacy by Divine Right Asserted*. In 1641, having joined the prelates who protested against the validity of all laws passed during their forced absence from parliament, he was committed to the Tower, and threatened with a prosecution for high treason, but was set at liberty, at the end of seven months, on finding bail for £5,000. After his return to Norwich, his revenues and property were sequestrated by parliament, an allowance of £400 a year being made for his support. He rented a small farm at Higham, near Norwich, to which he retired 1647. His works, mostly controversial have been published in folio, quarto, and octavo. They show wisdom and wit. A new ed., with autobiography, notes, etc., was published by the Rev. Josiah Pratt (Lond. 10 vols. 1808); a later ed. by the Rev. Peter Hall, descendant of Joseph (Oxford 12 vols. 1837-39). His writings most interesting at the present time are poetical *Satires*, written at college, which Pope, no mean judge of that species of composition, affirms to be 'the best poetry and the truest satire in the English language.' Hallam, however (*Lit. Hist. of Europe*), accuses him of being 'harsh and rugged,' and asserts that 'his lines frequently bear no visible connection in sense or grammar with their neighbors.' Among his works are *Contemplations*, *Art of Divine Meditation*, and *Enochismus, or Treatise on the Mode of Walking with God*.

HALL, LYMAN, M.D. 1725-90, Oct. 19; b. Conn.: signer of the Declaration of Independence. He graduated at Yale

HALL.

Coliege 1747; removed to Sunbury, Ga., and began practicing medicine 1752; was a member of the Savannah conventions 1774,5; delegate to and member of congress 1775-80; and gov. of Ga. 1783. His property was confiscated by the British during the occupation of Ga., and after his term as gov. he retired to private life.

HALL, MARSHALL, M.D.: physiologist and physician: 1790, Feb. 18—1857, Aug. 11; b. Basford, Nottinghamshire. At the age of 20 (having been previously apprenticed to a chemist) he began the study of medicine at the Univ. of Edinburgh, where, 1812, he took his degree M.D. After three years at the leading schools of medicine on the continent, he began practice in Nottingham 1815, and rapidly obtained high provincial reputation. In 1826, he removed to London, where his career as a physician was so successful that he was enabled at the age of 60 to release himself from strictly professional labor. Among his contributions to physiology are *Essay on the Circulation of the Blood* (1831), in which he made known his discovery of the remarkable 'caudal heart' connected with the vessels in the tail of the eel; paper 'On the Inverse Ratio which subsists between the Respiration and Irritability in the Animal Kingdom,' in the *Philosophical Transactions* 1832; and articles 'Hybernation' and 'Irritability' in Todd's *Cyclopedia of Anatomy and Physiology*. But his name is best known in connection with the doctrine of the Reflex Function of the Nervous System, which was his most engrossing subject of pursuit for the last 25 years of his life. In the *Philosophical Transactions* 1833 appeared his 'Memoir on the Reflex Function of the Medulla Oblongata and Medulla Spinalis.' His views were extended and corrected in various publications, especially his *Lectures on the Nervous System and its Diseases* (1836) *Memoirs on the Nervous System* (1837), *New Memoir on the Nervous System* (1843), and *Synopsis of the Diastaltic Nervous System* (1850). There has been much discussion as to H.'s claims to be considered the discoverer of Reflex Action. He admitted that the phenomena of which he treated had been long known to physiologists, but he believed himself to have been the first to show their independence of sensation, to bring them together under one generalization, to establish with precision the laws of their production, to assign them their just rank in physiology, and to apply the doctrine to the elucidation of disease. His more strictly professional writings are many and valuable. His last gift to the science of medicine and to humanity, was the description of a simple and easy method of restoring suspended respiration, which has been the means of saving many from untimely death: it is known as THE MARSHALL HALL METHOD (see ASPHYXIA). His memoirs, with a large collection of his letters, have been published by his widow.

HALL, NEWMAN, LL.B.: English Congl. minister: b. Maidstone, Kent, England, 1816, May 22. He graduated at the Univ. of London 1841; was pastor of the Albion Congl. Church in Hull 1842-54; and became pastor of Sur-

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rey (Rowland Hill's) chapel, London, 1854. He was a friend of the Union cause during the American civil war; visited the United States, opened congress with prayer, and delivered an oration in the house of representatives on *International Relations* (1867); and built Lincoln Tower, adjoining his new chapel on Westminster Bridge road, as evidence of international good-will, with funds contributed in the United States and England. He made a second visit to the United States 1873. He received his degree from the Univ. of London 1855. He died, 1902, Feb. 18.

HALL, ROBERT: English Baptist minister, one of the greatest of English pulpit orators: 1764, May 2—1831, Feb. 21; b. Arnsby, near Leicester, England; son of a Bapt. minister of some note as a preacher and author of religious works, and was the youngest of 14 children. At the age of 15 he was sent to a Bapt. academy at Bristol, when he gave promise of his future fame as an orator. In 1781, he entered King's College, Aberdeen, where he remained four years. Graduating 1785, he became at the age of 21, assistant Bapt. minister and tutor in the acad. at Bristol. In consequence of a disagreement with his colleague, he went 1790 to Cambridge, where, by his elaborate composition and vivid eloquence, he rose to the highest rank of British orators.

HALL, ROBERT HENRY: an American military officer; b. 1837; was graduated at the U. S. Military Academy in 1860; promoted 1st lieutenant, 1861; captain, 1863; major, 1883; lieutenant-colonel, 1888; colonel, 1893; and brigadier-general, 1901; and in the volunteer service was commissioned a brigadier-general, 1898. He served throughout the civil war and the war with Spain with distinction. In 1899 he went to the Philippines; conducted an expedition from Siniloan to Binangonan; occupied the latter place, 1900, Oct. 9; captured insurgents' gun-boat; and took possession of the island of Polillo Oct. 12 following.

HALL, THOMAS: an American inventor; b. in Philadelphia, Pa., 1834, Feb. 4; was educated at the University of Pennsylvania, and subsequently took a course in mechanics in Europe. His inventions include a mechanism for printing by touching keys; a keyed typewriter, which he exhibited at the Paris Exposition, 1867; the Hall typewriter; sewing machines, etc.

HALL, THOMAS CUMING: an American clergyman; b. in Armagh, Ireland, 1858, Sept. 25; was graduated at Princeton University, 1879; and Union Theological Seminary, 1882; subsequently studied in Berlin and Göttingen; held pastorates in Presbyterian churches in Omaha, 1883-86, and in Chicago, 1886-87; and became professor of theology at Union Theological Seminary in 1898. He was author of *An Endless Life*; etc.

HALL, or SWABISCH-HALL, swā'bīsh-hāl (SWABIAN HALL, swā'bī an hāl): old and picturesque town in the kingdom of Württemberg; beautifully situated in the deep valley of the Kocher, 35 m. n.e. of Stuttgart. It is surrounded by a ditch and by high walls surmounted with towers. Like other places in whose names the word Hall or Salz occurs,

HALLA—HALLAM.

H. has considerable salt-works, which, together with those of Wilhelmsglück, produce annually nearly 80,000 cwts. There are also tan-works, soap-works, and manufactures of cotton goods and bijouterie. Pop. (1880) 9,161.

H. at a very early period was the seat of a mint, and the coins first struck here was called Heller (Häiler). The town belonged first to the Counts of Westheim, then later to the Knights Templar. In the 13th c. it became a free imperial town, and such it remained till 1802, when, with its territory of 126 sq. m. (pop. 16,000), it was added to the kingdom of Württemberg.

HALLA, or HALA, *hāl'ā*: town of Hindustan, said to be the most ancient in the country of Sinde; on the left bank of the Lower Indus, 35 m. n. of Hyderabad. Here are extensive manufactures of caps, superior colored earthenwares, and lacquered work. Pop. (1872) 4,096, mostly manufacturers.

HALLAM, *hāl'am*, HENRY: philosophic historian and critic: 1777 (or 8)—1859, Jan. 21; b. Windsor, England; son of the Dean of Bristol. He was educated at Eton and Christ-church, Oxford, where he took his degree M.A. He was known first by his writings in periodicals, especially the *Edinburgh Review* in its early years; afterward, he was distinguished among the literary men of Europe for extensive and profound learning, powers of generalization, taste, judgment, and conscientiousness, exhibited in a succession of great works: *View of the State of Europe during the Middle Ages* (2 vols. 4to, 1818); *The Constitutional History of England from the Accession of Henry VII. to the Death of George II.* (2 vols. 4to, 1827); and *Introduction to the Literature of Europe in the 15th, 16th, and 17th Centuries* (4 vols. 4to, 1837-39), and a volume of supplementary notes to his *History of the Middle Ages* (1848). All these works have gone through several editions, and been translated into the languages of the leading European nations. They have procured for their author the enviable reputation of having opened a new and great field of authorship, and labored in it with a success not as yet equalled. Their wonderful impartiality and veracity are a rebuke to ordinary historians; and it provokes a smile to read, at this distance of time, the strictures of Southey on the acrimony, the arrogance, the injustice, and the ill-temper of their author; for England never produced a man who loved truth more disinterestedly than Hallam. It has however been justly said by a discriminating writer that H.'s 'criticism is apt to assume a tone of moral censure when he has to deal with certain extremes of human thought.' H., while yet a young man, was held in the highest estimation among the literary men of his time, in London and Edinburgh. During the greater portion of his long life, however, he lived in London in privacy, engaged in linguistic and historical studies. In politics, he was a whig; but for the conflicts of parties he was unsuited by his candor and general temperament, and took no part in them; but he displayed a genuine interest in all questions of social improvement, and acted with the

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Wilberforce party for the abolition of slavery, as well as in other humane schemes, and was one of the original promoters of the Soc. for the Diffusion of Useful Knowledge.

H. was a fellow of the Royal Soc., and of many other societies, and was a trustee of the British Museum. H. had two sons, both of great promise, and both prematurely cut off; the elder, ARTHUR HENRY H. (1811–33; d. on a tour, in Vienna), was the friend of Alfred Tennyson the laureate, to whose sister he was engaged to be married; and is the subject of *In Memoriam*. Of this son H. wrote a touching memoir.

HALLAMSHIRE, *hāl'am-shēr*: district in England, in the West Riding of Yorkshire (q. v.).

HALLE, CHARLES, LL.D.: pianist: b. Hagen, Westphalia, 1819. He studied first at Darmstadt; afterward at Paris, where his reputation was established by his concerts of classical music. After the revolution of 1848, he went to England, ultimately settling in Manchester. He and his highly trained orchestra were familiar to the music-lovers of Great Britain from London to Aberdeen. He did much to raise the popular standard of musical taste. He was made LL.D. of Edinburgh Univ. 1884. He d. 1895, Oct. 25.

HALLE, or HALLE AN DER SAALE, *hāl'leh ân dër sâ'leh*: city of Prussian Saxony, dist. of Merseburg; on the right bank of the Saale, and on several small islands of the river, 20 m. w.n.w. of Leipzig. (H. an der Saale is to be distinguished from several other places named H.) In the old town, the streets are narrow and crooked. As an important railway centre, H. has of late years rapidly increased in size, industry, and prosperity. Its famous university was founded 1694, by Frederick I., King of Prussia, and, after having been suppressed by Napoleon when it had attained the summit of its fame, was re-established 1815, and incorporated with the Univ. of Wittenberg, which had been dissolved during the war. At first a chief seat of the pietistic school of theology, H. subsequently became the headquarters of rationalism and criticism. The roll of its professors shows a long array of names distinguished in every faculty. There are attached to the univ. a theological and a pedagogical seminary, an agricultural institute, an observatory, surgical wards, an anatomical theatre, and botanical garden, and a library of 100,000 vols., and various scientific collections. The endowments for the professors and lecturers (over 100 in number) are liberal. The students in attendance number ordinarily between 800 and 900. The Francke Institution is one of the most important establishments of the place: see FRANCKE. The red tower on the market-place, the town-hall and the remains of the Moritzburg, ancient residence of the archbishops of Magdeburg, are interesting to the antiquary. H. is amply provided with benevolent and educational establishments for the poor, and has a well-conducted institution for the blind, deaf and dumb, and insane, with free schools for both sexes, and, as the chief town of a district, is the seat of various govt. offices and courts of jurisdiction. H. has manufactories of woolen and linen

HALLE—HALLECK.

fabrics, gloves, buttons, hardware, and starch ; but its most important industrial product is salt, obtained from the brine-springs within and near the town, which have been worked from a very early period, and still yield between 200,000 and 300,000 cwts. annually. Those within the town are worked by a private company ; the suburban works are held by government. The men employed at the salt-springs, and known as the 'Halloren,' are a distinct race, supposed by some to be of Wendish, and by others of Celtic, descent, who have retained numerous ancient and characteristic peculiarities. Pop. (1871) 52,639 ; (1880) 71,484 ; (1900) 156,611.

H., originally a border fortress against the Slavs, became in the 10th c. an appanage of the Archbishops of Magdeburg, and by the 12th c. was famous as a commercial city. In the 12th and 13th c., H. was a powerful member of the Hanseatic league, and waged war with neighboring potentates. Terribly impoverished during the Thirty Years' War, H. was incorporated with the dominion of the Elector of Brandenburg at the peace of Westphalia.

HALLE, *hál'leh*, or HALLEIN, *hál'tin*: town of Austria, duchy of Salzburg, 10 m. s. of the town of Salzburg ; on the right bank of the river Salza ; noted for extensive salt-works and saline baths. It has important cotton and needle and button factories. The Dürrenberg, a mountain 2,388 ft. above sea-level, from which the brine is obtained, has 34 shafts, or rooms, from which the salt is conveyed in large wooden troughs to the works within the town. The annual produce amounts to about 200,000 cwts. Good rock-salt is obtained also from Dürrenberg. Pop. about 5,000.

HALLEAN HERETICS, n. *hál'lē-an hēr'ē-tiks* [from *Halle* in Swabia]: in *chh. hist.*, name given to the Cathari, the Waldenses, or the Petrobrusians, in the 13th century.

HALLECK, *hál'ek*, FITZ GREENE : 1790, July 8—1867, Nov. 19 ; b. Guilford, Conn.: poet. By his mother, Mary Eliot, he was descended from John Eliot, 'the apostle of the Indians.' He became a clerk in a bank in New York, 1811, and was afterward in business. He was confidential agent of John Jacob Astor, 1824-49. In 1849, he retired, and took up his residence in his native place, where he spent the remainder of his days. From his boyhood, H. wrote verses ; but in 1819, he wrote his longest poem, *Fanny*, a satire on the literature, fashions, and politics of the time, in the measure of *Don Juan*. He also wrote, under the signature 'Croaker Junior,' in the humorous series of 'Croaker papers' for the New York *Evening Post*. H. visited Europe 1822-3, and published an edition of his poems 1827. H.'s style is spirited, flowing and graceful, smooth and harmonious. His poems show geniality and tender feeling, with delicate and refined humor. They are included in a 12mo volume of moderate size.

HALLECK, HENRY WAGER: 1816, Jan. 15—1872, Jan. 9 ; b. Waterville, Oneida co., N. Y.: soldier. He entered West Point Military Acad. 1835, graduated 1839 ; and for about a year acted as assist. prof. of engineering ; 1841-44, was employed in connection with the fortifications in New York

HALLEL--HALLELUIAH.

harbor; 1845, was sent on a govt. mission to examine European military establishments, and, returning, delivered in the Lowell Institute, Boston, a course of lectures on military art and science. During the Mexican war, he served on the lower coast of California, and, for his gallant services, was breveted capt. 1847. Was sec. of state for California, 1847-49, under the military govt. of Kearney, Mason, and Riley; and in 1849, was a member of the convention to form and draft the state constitution. He became capt. of engineers 1853, left the service 1854, and practiced law in San Francisco. On the outbreak of the civil war, he joined the Northern army 1861 as maj.gen., and in Nov. was appointed commander of the Dept. of the West. In 1862, July, he became general-in-chief, holding this position till 1864, Mar., when he was succeeded by Gen. Grant, and was appointed chief of staff. He commanded the division of the James, 1865, in which year he was transferred to the military division of the Pacific; thence he was transferred to that of the South, which he held till his death, at Louisville, Ky. Besides his Lowell lectures, he published various works on the law of mining, and on international law.

HALLEL [Heb. *praise*]: in the largest sense, The Book of Psalms, the name for which, in the Jewish Scriptures, is simply, Praises. In a restricted sense, the name is applied to several portions of the book—e.g., to that which comprises Ps. xiii-xviii., which, according to Hengstenberg, was usually called the ‘great hallel,’ and was sung especially at the Feast of Tabernacles and the Passover. The hymn which the Saviour and the apostles sang at the close of his last observance of the Passover with them, was probably a part of these psalms. But the grandest occasion on which this great hallel was used was at the entrance of Christ into Jerusalem, when the multitudes that went before and that followed cried, ‘Hosanna to the son of David: *Blessed is he that cometh in the name of the Lord.*’ And when, on the next day, Jesus said to the chief priests and elders, Did ye never read, ‘*The stone which the builders rejected, the same was made the head of the corner?*’ it was no half-forgotten sentence of which he reminded them, but a conspicuous part of their own great hallel, which they and the whole nation were preparing to sing in the Temple service and at home.

HALLELUIAH, int. *hāl lī-lō yā*, also spelled HAL’LELUJAH and AL’LELU’IAH or AL’LELU’IA [Heb. *halelū Jah*, praise ye Jehovah—from *halal*, to praise; *Yah* or *Jah*, Jehovah]: *Praise ye the Lord*: N. a song of praise or thanksgiving; one of the forms of doxology used in the ancient church, derived from the Old Testament, and retained, even in the Greek and Latin liturgies, in the original Hebrew. The singing of the doxology in this form dates from the very earliest times; but considerable diversity has prevailed in different churches and at different periods as to the time of using it. In general, it may be said that, being in its nature a canticle of gladness and triumph, it was not used in the penitential seasons, nor in services set apart for occasions of sorrow or humiliation. In the time of St. Augus-

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tine, the African Church used the H. only from the feast of Easter to that of Pentecost. In other churches, it was found in most of the services throughout the year, with the exception of the seasons of Lent and Advent and the vigils of the principal festivals. In the Rom. Cath. Church, the H. is introduced both into the mass and into the several hours of the public office, but it is discontinued from Septuagesima Sunday until Easter; and on the contrary, during the interval between Easter and Pentecost, it is introduced more frequently into the services and in circumstances of greater solemnity. It is always omitted in the services for the dead, and on the ember days, at the quarter tense, and on the principal vigils. In the Church of England, the first Prayer-book of Edward VI. retained the H. in the original Hebrew. In the present Prayer-book, though retained, it is not in the Hebrew, but in its English equivalent, *Praise ye the Lord*. See Binterim's *Denkwürdigkeiten der Christ-Kathol. Kirche*.

HALLELUJAH LASS, n. *h'el-lil-lō'ya l'is*: name given to those women, officers, or members of the 'Salvation Army,' who are prominent in the public exercises.

HALLER, *hál'ér*. ALBREC T VON: 1708, Oct. 16—1777, Dec. 17; b. Bern: physiologist. In early life, he was feeble, being affected with rickets, a disease frequently accompanied by intellectual precocity. His father, Nicholas Emmanuel von H., an advocate, intended him for the clerical profession; but his own inclinations were toward the medical, and, 1723, two years after his father's death, he went to the Univ. of Tübingen, where he was pupil of the well-known anatomist Duvernoy. In 1725, he removed to Leyden, attended the lectures of Boerhaave and of Albinus, and obtained the degree M.D. 1727. He then visited London, Oxford, and Paris, where he studied anatomy and botany under Winslow and De Jussieu; but one of his neighbors, annoyed by his dissections, having threatened to denounce him to the police, he retreated to Basel, where he became pupil of John Bernoulli, mathematician. After seven years' study in these different seats of learning he returned in his 22d year to his native city, and began practice as a physician. The prof. of anatomy, Meig. having fallen ill, H. undertook the duties of his class; he also published a celebrated descriptive poem entitled *Die Alpen* (The Alps). In 1735, he was appointed physician to the hospital, and, shortly afterward, principal librarian and curator of the cabinet of medals; but in 1736, George II., wishing to establish a univ. at Göttingen, offered him the professorship of medicine, anatomy, botany, and surgery, which, after hesitation, he accepted. From this time, he gave up professional practice, applying himself for the next 18 years to teaching and original research. He was active in the formation of the Royal Acad. of Sciences of Göttingen, whose memoirs, *Commentarii Societatis Regiæ Scientiarum Göttingensis*, contain many of his papers. During his professorship, 1736-53, he composed and published 86 works on medical subjects,

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chiefly physiology and botany; and it is recorded that he contributed more than 12,000 notices or reviews of books to the *Göttingische gelehrte Anzeigen*, a monthly periodical, of which he was editor. In 1753, in consequence of disputes with his colleagues, and probably in part from the delicate state of his health, he resigned his chair, and returned to his native town, where he subsequently held important and honorable offices. He retained his position as pres. of the Royal Acad. of Sciences. After his retirement from Göttingen, some of his most important writings were published, among which were *Elementa Physiologiæ Corporis Humani* (Lausanne, 8 vols. 4to 1757-66)—by far the most important of his works—and his four *Bibliothecæ*, or critical catalogues of works on botany, surgery, anatomy, and medicine. The increasing maladies of his later days did not distract his mind from his favorite studies. He recorded all the symptoms of his last illness—a combination of gout and disease of the bladder—and the gradual cessation of his vital functions; and his last words, addressed to his physician, were: 'My friend, the pulse has ceased to beat.'

H.'s eminence as a man of science was duly recognized even in his own lifetime. In 1739, he was appointed physician to the king of Great Britain; he was ennobled by the emperor of Germany, 1748; the universities of Berlin, Oxford, and Utrecht in vain endeavored to obtain him as professor; and he was an honorary member of all the scientific societies of Europe. His name is connected especially with the doctrine of muscular irritability (see MUSCLE AND MUSCULAR TISSUE); and though he made few positive additions to our knowledge, his teaching and writings impressed a new aspect on physiology—a science of which he has been termed 'The Father.' Moreover, by his work as poet, H. contributed to the movement which toward the end of the 18th c. brought new life to German poetry.

HALLEY, *hāl'i*. EDMUND: astronomer and mathematician: 1653, Oct. 29—1742, Jan. 14; b. Haggerston, near London; son of a London soap-boiler. He was educated at St. Paul's School, and at Queen's College, Oxford, which he entered 1673. He early became an experimenter in physics—before leaving school, he had made observations on the variation of the needle. In 1676, he published a paper (*Philosophical Transactions*) on the orbits of the principal planets; also observations on a spot on the sun, from which he inferred its rotation round its axis. In Nov. of the same year he went to St. Helena, where for two years he applied himself to the formation of a catalogue of the stars in the s. hemisphere, which he published 1679 (*Catalogus Stellarum Australium*). On his return, he was chosen a fellow of the Royal Soc., and deputed by that body to go to Danzig to settle a controversey between Hooke and Helvetius respecting the proper glasses for astronomical observations. In 1680, he made the tour of Europe, during which he made observations with Cassini at Paris on the great comet which bears H.'s name, and whose return he predicted. His observations on this comet

HALLEY'S COMET—HALL, HALLE, HALLEIN.

formed part of the foundation of Newton's calculation of a comet's orbit. H. returned to England, 1681, and published (*Phil. Trans.*), 1683, his theory of the Variation of the Magnet. The next year, he made the acquaintance of Newton—the occasion being his desire for a test of a conjecture which he had made that the centripetal force in the solar system was one varying inversely as the square of the distance. He found that Newton had anticipated him both in conjecturing and in demonstrating this fact. For an account of H.'s connection with the publication of the *Principia*, see NEWTON. In 1686, H. published an account of the trade-winds and monsoons on seas near and between the tropics, which he followed by other chemico-meteorological papers. In 1692, he published his hypothesis relative to the change in the Variations of the Needle, to test the truth of which, by obtaining measures of the variations in different parts of the world, he was sent, 1693, in command of a ship to the western ocean; but his crew mutinied, and he was compelled to return. The next year, he sailed again on a similar expedition, and the result was given in a general chart, for which he was rewarded by the rank of capt. in the navy with half-pay for life. He made a chart of the tides in the channel, and surveyed the coast of Dalmatia for the emperor of Austria. In 1703, he was appointed Savillian prof. of geometry at Oxford; 1705, he published his researches on the orbits of the comets; 1713, on the death of Sir Hans Sloane, he became sec. of the Royal Soc.; 1716 he made valuable experiments with the diving-bell; 1720, after the death of Flamsteed, he became astronomer-royal. In this office, and engaged especially in studying the moon's motions, he passed the rest of his life. In 1729, he was chosen a foreign member of the Acad. of Sciences, Paris. He died at Greenwich. H. had married, 1686, a daughter of Mr. Tooke, auditor of exchequer, by whom he had several children. H.'s writings were numerous. His *Tubulæ Astronomicæ* did not appear till 1749. Among his principal discoveries were those of the long inequality of Jupiter and Saturn, and of the slow acceleration of the moon's mean motion. He has the honor of having been the first who predicted the date of return of a comet, and also of having recommended the observation of the transits of Venus with a view to determining the sun's parallax—a method of ascertaining the parallax first suggested by James Gregory.

HALLEY'S COMET: see COMET.

HALL—HALLE, *hál'leh*—HALLEIN, *hál'lín*: names of various places in Southern and Middle Germany, possessing salt-works. *Hall* is also a general name for a salt manufacture. The Welsh and Armorican word for salt is *hal*, *halen*; hence it is inferred that these names were bestowed by Celtic tribes of the Cymric division (to which the ancient Gauls belonged). The Gaelic for salt is *sal-ann*, agreeing thus with the Lat. *sal*, and the Ger. *salz*. The Greek *hals* (*ἅλς*) agrees with the Cymric. The names Salza, Salzburg are clearly of Teutonic origin.

HALLIARDS--HALLOYLITE.

HALLIARDS, n. plu. *hăl'yêrdz* [*hale*, or *haul*, and *yard*]: ropes or tackles, on their respective masts, for hoisting or lowering sails or yards.

HALLIWELL-PHILLIPPS, *hăl'î-wěl fîl'îps*, JAMES ORCHARD: 1820, June 21, 188.), Jan. 1, b. Chelsea, England: author. He studied at Cambridge Univ., but did not graduate; began editing and publishing the old English authors and ms. texts 1839, was chiefly instrumental in purchasing Shakespeare's estate and organizing the Shakespeare Museum at Stratford-on-Avon 1863, assumed the name Philipps by royal license 1872. He published *Shakespeareana* (1841), *History of Freemasonry* (1842), *Dictionary of Provincial and Archaic Words* (1844-5), *Life of Shakespeare* (1845), edition of *Shakespeare's Works*, 16 fol. vols. (1853-65), *Calendar of the Records of Stratford-on-Avon* (1863), *History of New Place* (1864), and *Outlines of the Life of Shakespeare* (5th ed. 1885).

HALLOO, or **HALLOA**, n. *hăl-lô'* [OF. *halle*, an int. of cheering or setting on a dog: F. *hallali!* whoop! Low Ger. *hallo*, outcry: Sp. *jalear*, to encourage hounds to follow the chase]: a shout to attract attention: V. to cry loudly after; to shout to. **HALLOO'ING**, imp.: N. a loud shouting. **HALLOOED**, pp. *hăl-lôd*. **VIEW-HALLOO**, hunting-cry when the fox breaks cover.

HALLOW, v. *hăl'lô* [AS. *halgian*, to keep holy—from *halig*, holy]. to make holy; to consecrate; to honor as sacred; to devote to holy use. **HAL'LOWING**, imp. **HALLOWED**, pp. *hăl' lôd*: ADJ. consecrated to a sacred use; treated as sacred. **HALLOWFAIR**, n. *-fär*, in Scot., a market held in November. **HALLOWEEN**, n. *hăl'lô-ên*, or **HALLOWEVEN** [*hallow*, and *even*]: popular name of the eve or vigil of All Hallows, or festival of All Saints. As the date of that festival is Nov. 1, Halloween is the evening of Oct. 31. In England, it was long customary to crack nuts, duck for apples in a tub of water, and perform other harmless fire-side revelries. Anciently the most essential ceremony seems to have been the lighting of a bonfire at nightfall by every household (see **BELTANE**). In Scotland, the ceremonies partook more of a superstitious character; taking, among rustics, the form of a charm to discover who should be his or her partner for life. Of these now almost exploded customs, the best summary is in Burns's well-known poem *Halloween*. See Brand's *Popular Antiquities* for some notice of old Halloween practices. **HALLOWMAS**, n. *hăl'lô-mäs* [*hallow*, and *mass*]: the feast of All Hallows or All Saints, Nov. 1.

HALLOWELL, *hăl'ô-wěl* or *hăl'ô-wêl*: city in Maine, on the Kennebec river, 2 m. s. of Augusta. It has a town-hall, 6 churches, 3 banks, 1 newspaper office, a cotton-factory, etc. It is noted from the fine quality of granite in the neighborhood. Steamboats and vessels of nine ft. draught can load at wharves. Pop. (1890) 3,181; (1900) 2,714.

HALLOYLITE, n. *hăl-loyl'it*, or **HALLOY'SITE**, n. *-sît* [after Omalius d'*Halloy*]: a clayey mineral occurring in soft, smooth, amorphous masses of a whitish color, rich in alumina; a hydrated silicate of alumina.

HALLUCINATION.

HALLUCINATION, n. *hāl-lō'sī-nā'shūn* [F. *hallucination*—from L. *hallucinātiōnem*—from *hallucīnor*, I wander in the mind]: perception without any real object to be perceived; in a loose sense, also, delusion; error; an erroneous or insane belief in the reality of things which have no existence. **HALLUCINATORY**, a. *-nā'tēr-ī*, partaking of hallucination.—A *hallucination* is a morbid condition of mind in which perception takes place where no impression has been made upon the external organs of the special senses, yet where the object is believed to be real and existing. A picture is presented to the imagination when no ray of light has fallen on the eye; a voice is heard when all around has been silent; a pleasant smell fills the nostril when no fragrance is in the air. A delusion differs from a H. in that it originates at the other extremity of the chain of consciousness in the mind itself, and consists in erroneous interpretations of real sensations; e g. a form passes across the vision, and it is regarded as a phantom, or a demon, or what is not and cannot be; a voice addresses the listener in accents of friendship, which before they reach the mind have assumed the character of insults and calumnies; the fresh odor of a rose suggests notions of poison and pollution. Yet hallucinations may involve internal experiences as well as the reports from the outer world; nor is it invariably possible or necessary to distinguish hallucinations from delusions. There is a composite state in which the external impression is imaginary, and the interpretation from such an impression, had it been real, is erroneous. A clock is heard by a patient to strike where not a sound is audible by others, and the sound is held to be the announcement of doom. In all these cases, the sensorium itself must be held to be at fault, whether the nerves of seeing, hearing, etc., be structurally affected or not. These phenomena are observed in connection with all the senses, but in different proportions, the frequency being perhaps in relation to the number of healthy sensations of which the organ is the natural channel, and to the degree of excitement and cultivation to which it is ordinarily subjected. According to one authority, hallucinations of hearing constitute two-thirds of the whole observed; but, upon a more careful analysis, the following tabular expression of frequency appears correct: hallucinations of hearing, 49; of vision, 48; of taste, 8; of touch, 3; of smell, 1. These conditions are detectable in all mental diseases; but the proportion varies according to the form and the intensity of the alienation. All are more frequent in mania than in monomania and fatuity; and errors of vision are more numerous than those of hearing in mania. Lord Brougham at one time held that the presence of hallucinations should be elected into a crucial test of the existence of insanity. Practical men, however, demonstrate that mental derangement is not necessarily conjoined with such a symptom. Esquirol held that of 100 fanatics, four-fifths would be affected with hallucinations. Of 147 individuals in Bicêtre Baudry found that 56 presented hallucinations; and the subsequent researches of Thore and Aubanel in the same hospital showed 122 affected

HALLUIN—HALMALILLE.

out of 443 maniacs, monomaniacs, demented, etc. Brière de Boismont, *Des Hallucinations* (Paris 1845); Aubanel and Thore, *Recherches Statistiques faites à Bicêtre*; Michéa, *Du Délire des Sensations*; Sully, *Illusions* (1881).

Hallucinations of Sane Men.—In a great majority of cases, hallucinations can readily be traced to mental alienation, which is cognizable by other signs, or to conditions of the nervous system, which impair or pervert without overthrowing the mind; or to general constitutional states, or positive diseases, such as in the case of Nicolai, which involve disturbance of the functions of the external senses. There is, however, a class of phenomena which cannot be included under any of these categories; where objects appear; voices tempt, threaten, soothe, or where a series of impressions are received by the mind, without any corresponding sensation; where the system is perfectly healthy, and where the individual affected is conscious that what he sees or hears is unreal. Medical experience, however, goes to show that under such circumstances the nerve, or some organ connected with the development of special sensation, or the brain itself, is in an abnormal or excited condition, which falls short of disease, not interfering with the regular discharge of the ordinary functions of these parts of the economy, and not being detectable in any other way, and which is sometimes compatible with great intelligence and even genius. As illustrative of the latter proposition, and of the least morbid aspect of such phantasmata, it may be mentioned that the late Earl Grey was haunted by a gory head, which he could exorcise at will. Swedenborg, while at the head of the government, saw members of the heavenly hierarchy seated among the ministers at the council board, and bowed reverentially to them. Bernadotte encountered a woman in a red cloak in his rides; and a patient has been described who was followed first by a cat, then by a tatterdemalion beggar, and then by a skeleton which never left him, walked side by side, joined his family circle, and peered through his curtains at night. Yet Swedenborg knew that it was not flesh and blood realities he acknowledged; the king shrank from, but repudiated the red cloak; and the patient disbelieved the skeleton, and detected its true nature and origin.

HALLUIN, *âl-lû-âng'*: town of France, dept. Nord, 10 m. n n.e. of Lille. Weaving, bleaching, cotton spinning, and brick-making are carried on, and manufactures of linen and calico. Pop. 9,000.

HALLUX, n. *hāl lûks* [L. *hallex*, the great toe]: the innermost of the five digits which compose the hind foot of a vertebrate animal; the great toe.

HALM, or **HAULM**. n. *hawm* [Ger. *halm*; Icel. *halmr*, a stalk, straw: OF. *chaulme*; F. *chaume*, straw—from L. *cālāmus*, a reed]: the stem or stalk of grain; the dead stems of herbs, as of the potato

HALMALILLE, *hāl ma-îl* (*Berrya amonilia*): tree of nat. ord. *Tiliaceæ*, closely allied to the Lime or Linden tree of Europe, and much resembling it, but larger; native of

HALMSTAD—HALOGEN.

Ceylon, much valued for its timber, which is a favorite house-building wood in that island, and is used also for carts, casks, and all household purposes, and for boat-building, as it is believed to resist the attacks of marine worms, and in virtue of a certain unctuousity, to preserve the ironwork from rust. It is exported to Madras—where, from the principal port of exportation, it is known as *Trincomali Wood*—and the Masula boats which brave the formidable surf there, are made of it. It is a light wood.

HALMSTAD, *hålm'stådd*: town of Sweden, on the e. shore of the Cattegat arm of the North Sea, at the mouth of the Nissa river, 76 m. s.s.e. of Gothenburg. It was an important fortified post 1225, and its defensive works remained till 1736; was frequently chosen as the meeting-place of the sovereigns of the three northern kingdoms; appointed as the place for the election of a new Scandinavian monarch whenever necessary; taken from Denmark by Gustavus Vasa 1534; ceded to Sweden 1660; and was the scene of the defeat of the Danes, while trying to retake it, by Charles XI. 1676. It has a grand harbor constructed 1837-40, large salmon fisheries, and a valuable trade in lumber and pitch. Pop. (1888) 10,492; (1901) 15,567.

HALO, n. *hālō* [F. *halo*; Gr. *halōs*, a halo]: a circle or ring of prismatic light around the sun or moon, but distinct from a corona: see **HALO—PARHELION—CORONA**: in a *painting*, a bright ring around the head of a holy person; a glory or nimbus. **HALOED**, a. *-lōd*, surrounded by a halo.

HALOGEN, n. *hāl'ō-jēn* [Gr. *hals*, salt; *gennāō*, I produce]: the electro-negative element of a haloid salt. The halogens are a distinct group of non-metallic monads, chlorine, iodine, bromine, and fluorine, which by combination with metals, produce saline compounds: their most important characteristics are the following:

1. They combine directly and at an ordinary temperature with the metals for which they exhibit very strong affinity; and their combinations with the metals present those properties which pertain to salts (q.v.). No elements excepting these four possess the property of entering into direct combination with metals, and of thus forming salt-like compounds. When united with the same metal, the salts which the different halogens form are isomorphous; thus, for example, the chloride, iodide, bromide, and fluoride of potassium all crystallize in cubes.—2. They all have very energetic affinity for hydrogen, with which they all unite in one definite proportion—viz, 2 volumes of the gas or vapor of the halogen with 2 volumes of hydrogen, the union occurring without change of bulk, that is to say, being represented by 4 volumes, and the resulting gaseous compound being intensely acid, and very soluble in water. The acids thus formed are hydrochloric, hydrobromic, hydriodic, and hydrofluoric acids. Moreover, all these halogens (except fluorine) form powerful acids with five atoms of oxygen—viz, chloric, bromic, and iodic acids; and their salts present numerous points of resemblance. These four elements are often called *haloids*. A few radical groups

HALOID—HALO, PARHELION, CORONA.

play a similar rôle, but it is best to restrict the term to the four elements to avoid confusion. HALOGENOUS, a. *hă-lŏj'-ĕ-nŭs*, having the nature of a halogen. HALOID, n. *hă-lŏyd*, or HALOID-SALT [Gr. *eidos*, resemblance]: a salt-like compound produced by the union of one of the halogens with a metal; e.g. chloride of sodium (NaCl), bromide of silver (AgBr), fluoride of calcium (CaF₂), and iodide of potassium (KI).

HALOID: see under HALOGEN.

HALOMETER: see GONIOMETER.

HALO, *hă-lŏ*—PARHELION, *păr-hĕ'ŭ ŭn*—CORONA, *ko-rŏ'nă*—etc.: various meteorological phenomena. (For Corona as an astronomical phenomenon, see CORONA.) It would not be easy even to enumerate the various distinct phenomena of the above classes: a few of the principal varieties are here indicated; though these illustrate the others, except as concerns mathematical relations.

One class of coronæ is very common. When the sun or moon is partially obscured by a mist or cloud, the latter *not* being of the species called cirrus (see CLOUD), it is almost invariably surrounded by colored rings of a few degrees only in diameter, called *Coronæ* (crowns). Those surrounding the sun cannot always be seen directly; but by reflection at the surface of still water, or of a glass-plate blackened at the back, the glare of the sun-light is sufficiently diminished to permit the corona to be seen. This meteor depends on the DIFFRACTION (q.v.) of light, caused by the small spheres or vesicles of water which compose the cloud, and can easily be imitated by looking at a bright object through a piece of glass which has been breathed upon, or dusted with Lycopodium seed. If the diffracting particles be all of the same size, the rings are well marked; but since they become smaller as the particles increase in size, ordinary fogs and clouds, which generally contain particles of very different dimensions, give a composite effect, which spoils the distinctness, and greatly limits the number of the rings. Thus, no general rule can be given for the number or colors of the coronæ, but it may be observed that their diminution in diameter is a sign of the increase in size of the watery spheres which cause them, and therefore in general betokens approaching rain, which comes when the particles are no longer able, on account of their size, to float in the air without sensibly falling.

A different form of corona is sometimes seen to surround the shadow of the spectator's head, when cast by the sun on a bank of fog—in this case it is sometimes called a *glory*. To this class belong the colors generally seen about the famous 'Spectre of the Brocken': see BROCKEN. The same appearances are frequently seen round the shadow of the spectator when it is thrown on muddy water, or water carrying numerous small particles of sand. The optical explanation, founded mainly upon reflection and interference, is complete, but not in place here.

So far the phenomena depend merely on the cloud or fog consisting of small particles; nothing has yet been said

HALO, PARHELION, CORONA.

about the *shape* of the particles. Spherical *drops* of water produce Rainbows (q.v.), and upon the vesicular form which moisture often assumes in the air, probably depend the blue of the sky and the gorgeous tints of sunrise and sunset. But halos (Gr.) and parhelia (Gr. false or mock suns) depend on the presence in the air of innumerable *crystals* of ice, generally forming a light cirrus cloud. A general idea of the origin of these phenomena is given below. For thorough knowledge of the subject, consult a memoir by Bravais (*Journal de l'Ecole Polytechnique*, XVIII.).

The theory of halos was first roughly attempted by Huyghens; but though his explanations are in the main correct (at least, as regards the simplest of the appearances), they are based on the utterly inadmissible supposition, that the halo-producing clouds are formed of cylinders of water, each having an opaque, frozen nucleus. It will be seen that the results of this supposition agree with those of the correct one in a few cases only. Further progress was impossible until the crystalline form and the refractive index of ice were observed. Both of these observations are of great difficulty; but they have been carried out by Wollaston and others with considerable accuracy. After Huyghens, Mariotte, admitting the crystalline form of ice-particles, made some great steps in advance, and much of what he left unexplained was successfully supplied by Young, and later by Kaemtz. The most complete and systematic explanation of the whole subject, however, is that of Bravais, above referred to. There, references are given to nearly all the accurately recorded observations of halos and parhelia—the great mass of which, of course, are due to arctic voyagers, especially Scoresby and Parry.

Water crystallizes in the form of regular hexagonal prisms, sometimes with plane ends perpendicular to the sides (as in fig. 1), sometimes with hexagonal pyramids as terminals (fig. 2). There is also an immense variety of



Fig. 1.



Fig. 2.

much more complex forms; but on the simpler and more common ones above mentioned, depend the ordinary cases of the phenomena here described. Now, if we consider any two non-parallel faces of one of the above crystals, it is clear that their combination must act as a prism, decomposing white light, which passes through them, into its constituent colors. Every such

crystal, then, placed somewhere near the line joining the eye and sun, must in general send to the former some definitely colored ray from each effective pair of surfaces. The refractive index, however, of ice is such that no ray can pass through a prism of it whose angle is greater than about $99^{\circ} 5'$; and we are therefore limited to pairs of faces whose inclinations is not superior to this. The most important pairs are two *alternate* faces of the prism (fig. 1); where the inclination is 60° , and a face with a terminal plane (fig. 1), the angle being 90° .

HALO, PARHELION, CORONA.

Halo of 22° Radius.—We may now suppose prisms of ice, with refracting angles of 60° , to be distributed (with every possible position of their axis) nearly between the sun and the spectator, and it is evident that the appearances produced must be symmetrical with regard to the line joining the eye and sun, and must therefore consist of colored circles with the sun as centre. To attain a more exact idea of the nature of these circles, suppose that we are dealing with light of one color only (say red). Now (see PRISM), if a beam of homogeneous light falls on a prism, it is refracted without separation. If the prism be turned gradually and uniformly about its axis, the refracted ray also turns, but *not* uniformly—at first rapidly, then slower, till it reaches a point at which it appears to be stationary for a little; then, on further turning the prism, the refracted ray *retrogrades*, at first slowly, then faster. There is therefore a position of the prism, called that of *minimum deviation*, for which a slight alteration of the prism produces none in the direction of the refracted ray. Hence, as we have supposed prisms to be in the cloud in every possible position, those which are near the position of minimum deviation will conspire to refract light in the *same* direction, and their effects will be added. All the others will cause a *greater* deviation of the light, but few will conspire to send the light in any given direction. The appearance will therefore be a bright circle of red light surrounding the sun as centre, its angular radius being the angle of minimum deviation, which for a prism of ice of 60° angle, is about $21^\circ 50'$. Inside this circle there will be *no* light; outside, a feeble illumination only, becoming fainter as we go further from the sun. With orange light alone, there would be a somewhat larger circle, and so on. Hence, when white light falls on such a system, the effect is a circular halo, dark within, red on its inner edge, and with a mixture of more or less of the colors of the spectrum from inside outward; so that, like the rainbow, which it much resembles, it differs from the ordinary spectrum (q.v.).

If we consider next the light *reflected* from the surfaces of the prisms, this will be *white*, and diffused with approximate uniformity all about the sun.

But the prisms of fig. 1 are not likely to be suspended in the air in all positions alike. If the prism be long and fine, it will have a tendency to fall end foremost, i.e., with its axis vertical, or (it may be) horizontal. If it be a flat hexagonal cake (a frequent form of snow), it will tend in the main to fall edgewise, so that, in addition to the halo which depends on the ice-crystals having every possible position, there are distinct phenomena depending on an excess of the crystals having their axes vertical or horizontal. If we consider the sun as just rising or setting, it is plain that the right and left-hand portions of the halo will be much more strongly marked than the others, as these parts are formed by crystals whose axes are vertical, and which form the majority. There are therefore to right and left of the sun, and on the halo, bright-colored images of the sun, called *parhelia*, or mock-suns.

HALO, PARHELION, CORONA.

It is perhaps more difficult to explain to the non-mathematical reader the formation of parhelia when the sun is not on the horizon, and to show why they then separate from the halo, and are formed externally to it, still, however, at the same altitude as the sun. Suppose an indefinitely long vertical prism; rays of sunlight falling on this are separated, as before, but if the sun be not on the horizon, they no longer fall on the prism perpendicularly to its edge. Optics, however, show us that for this oblique incidence also there is a position of minimum deviation, and therefore one angular distance from the sun at which the effects of a great number of prisms conspire, while far fewer conspire at any other angle. It is also shown that this minimum angle is greater as the incidence is more oblique. Also the inclination of the incident and refracted rays to the edge of a prism is always the same, however the ray may fall. Hence, as the edges of the prisms in question are vertical, the refracted rays appear to come from a point at the same altitude as the sun, and, by what was remarked above, further from the sun as the sun is higher. Hence the formation of the parhelia consisting of two colored images of the sun, at the same altitude as that body, and further beyond the halo as the sun is higher. Accurate measurements of their distance from the sun for different altitudes have been found to accord exactly with the results of calculation from the optical data. See PP (fig. 3).

The light reflected from the surfaces of the vertical prisms, of course appears to come from an image of the sun in a vertical mirror, which, by optical laws, must have the same altitude as the sun itself. Such images then form a *white* horizontal small circle, passing through the sun and the parhelia. This is often observed, and helps to corroborate the above theory of the colored appearances. See the dotted line PSP (fig. 3).

The light reflected from the horizontal terminals of these prisms must evidently produce a single white image of the sun, as much below the horizon as the sun is above it, and *vice versa*. This appearance also is frequent.

Tangent arcs to the halo of 22°.—We have seen that in many cases the prisms of ice are so short as to be hexagonal plates. Their natural position in falling will be edge foremost, or there will be a multitude of snow-crystals whose axes are nearly horizontal, but of course arranged in all directions in the horizontal plane. Let us consider first all those whose axes are perpendicular to the line joining the spectator with the sun; these evidently (by an explanation similar to that of the parhelia given above) form parhelia on the halo at its upper and lower points. Another set, whose axes also are nearly horizontal and parallel, but slightly inclined to the former, will form parhelia to one or other side of the vertical plane passing through the sun, and on account of the obliquity of the incidence, the angle of deviation is increased, and these are *outside* the halo. They are further to the right or left of the sun's vertical plane, and further outside the halo as the crystals

HALO, PARHELION, CORONA.

are more and more turned in their horizontal plane. The complete result is a brightly colored pair of arcs, which *touch* the halo at its upper and lower points, and lie completely outside. For certain elevations of the sun, these combine, forming a curve like an ellipse, whose centre is the sun, whose larger axis is horizontal, and which touches the halo externally at its upper and lower points.

Halo of 46°.—This depends on the right-angled prisms, formed by combining a terminal plane with one of the faces of the hexagonal prism; and with the single exception of a different refracting angle, and its consequent greater dimensions, its explanation and its appearance are the same as those of the halo of 22°.

Perhaps the most magnificent, both for brightness and separation of colors, of all the halos, is the colored arc which touches the halo of 46° at its upper point. This depends entirely upon the refraction of light through the upper edges of prisms similar to fig. 1, and whose axes are *vertical*. It is therefore due to the same cause as the parhelia of the halo of 22°; and it is a remarkable proof of this, that there is but one instance recorded in which the former appeared without the latter; and its absence was then easily accounted for by there being no cloud of ice-crystals near enough to the sun to produce the parhelia. See fig. 3.

There are also sometimes seen brightly colored arcs touching one on each side the lower half of the halo of 46°. They are explained by the right angles of prisms whose axes are horizontal. Again, a parheliion being itself a source of light, sometimes very intense, may have *its* surrounding halos of 22°, etc. All phenomena of the latter class are termed *secondary*. They are in general, as might be expected, much fainter than the *primary* ones, but in favorable circumstances have been distinctly observed.

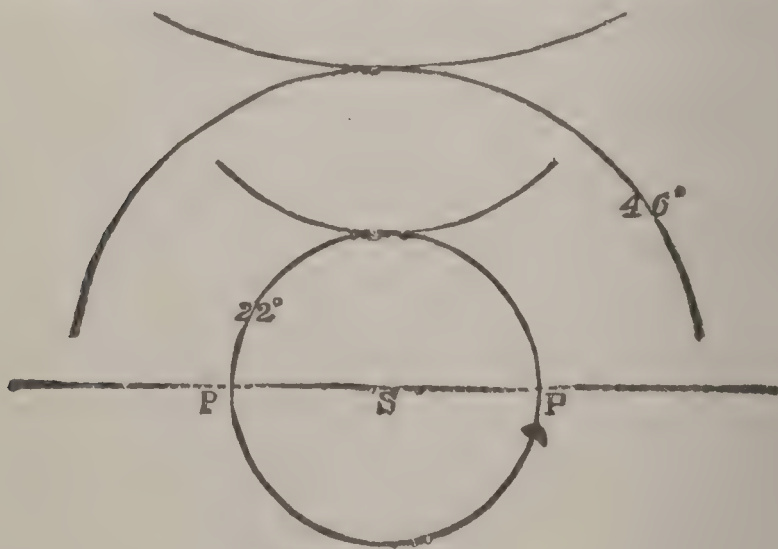


Fig. 3.

Other phenomena, easily predicted mathematically but unfitted for verbal explanation, are due to various combinations of planes of the hexagonal pyramid (fig. 2) with each other, or with planes of the prism.

HALOPHYTES—HALPINE.

Accompanying is a rough geometrical sketch of an approximately complete set of halos observed by Bravais, in Sweden, 1839. The marks on the sketch indicate to which of the classes above mentioned the various portions belong. The celebrated cross which Emperor Constantine saw in the heavens, abt. A.D. 313, and which led to his conversion from paganism, may have been part of a system of solar halos, two of which at right angles would form a cross.

HALOPHYTES, n. plu. *hāl'ō-fītz* [Gr. *hals*, the sea; *phŭton*, a plant]: in *bot.*, plants of salt marshes, containing salts of soda in their composition.

HALORAGIACEÆ, *hāl-o-rā-jī-ā'sā-ē*, or **HALORAGIÆ**, *hāl-o-rā-jē-ē*: nat. ord. of exogenous plants closely allied to *Onagraceæ* (q.v.).—There are about 70 known species, herbaceous or half-shrubby, scattered over the world, but almost all aquatic, or growing in wet places. The stems and leaves often have large air-cavities. The flowers and plants are generally small, and none have important uses except those of the genus *Trapa* (q.v.). Mare's Tail (*Hippuris vulgaris*) and Watermilfoils (*Myriophyllum*) are two of the species.

HALOSCOPE, *hāl-lo-skōp*: beautiful optical instrument invented by Bravais, of France, for exhibition of all phenomena connected with halos, parhelia, etc. It consists of a vertical axis, with a clock movement for the purpose of giving it rapid rotation; two glass prisms, one hollow to contain water; two opaque plates of glass to obscure one or two sides of the prisms, as required in different experiments; a quadrangular prism; and a small arm carrying a mirror: this last and the three prisms all are adapted for mounting on the axis. To imitate the parheliion, the vertical axis with the solid glass prism is set in rapid rotation in a darkened chamber, with a candle 10 or 12 ft. distant, but with the flame on the same plane as the rotating prism; two sides of the prism are to be obscured with the movable opaque slides of glass. The spectator then looks horizontally at the revolving instrument, and sees the parheliion circle. Different dispositions of the apparatus produce the allied phenomena.

HALOTRICHITE, n. *hāl-lōt'rī-kīt* [Gr. *hals*, salt; *thrix*, hair; *trichos*, of hair]: an iron alum, a mineral occurring in fibrous silky masses of a yellowish-white color.

HALPINE, *hāl'pīn*. CHARLES GRAHAM: 1829, Nov. 20—1868, Aug. 3; b. Oldcastle, co. Meath, Ireland: author. He graduated at the Univ. of Dublin 1846; began as a journalist; removed to New York 1847, and for several years was employed on the *Herald*, *Times*, and *Tribune* in New York, and the *Post* and *Carpet Bag* in Boston. He entered the Union army 1861, and, after an executive service of high merit, resigned with the rank of brevet brig.-gen. 1864. Returning to New York, he resumed editorial labor, and was elected register of the co. 1867. He was author of the poem *Tear Down the Flaunting Lie*; of many popular pieces in prose and verse over the pen-name *Miles O'Reilly* during the civil war; *Life and Adventures, Songs*,

HALS—HALSTEAD.

Services, and Speeches of Private Miles O'Reilly, 47th Regiment, New York Volunteers (1884), and *Baked Meats of the Funeral; a Collection of Essays, Poems, Speeches, and Banquets by Private Miles O'Reilly, etc.* (1866).

HALS, *hals*, FRANS: 1584–1666, Aug. 20; b. Antwerp: painter. He was a member of one of the Dutch milit. guilds, of the chamber of rhetoric, and chairman of the painters' corporation of Haarlem 1644. Through unfortunate personal habits, he was brought to absolute penury; and after paying his rent and fuel some time, the municipality gave him an annuity 1664. As a painter, he has been ranked immediately after Rembrandt and Vandyke, and was considered far more expressive than the former. There are portraits by H. in many continental galleries, though few have found their way to England or the United States. His sitters were taken from every class of society; and he seemed to delight in painting fishwives and boys and girls playing, singing, and laughing.—His son, FRANS H. (1622–69), was a painter of scenery and animal life, chiefly cottages and poultry; and one of his best works is the *Vanitas* at Berlin—Frans's brother, *Dirk H.* (d. 1656), also a painter, showed much of the freedom of the elder FRANS, though following an entirely different form. He revelled in festivals, ball-rooms, and scenes of gayety, and in this line is ranked second to Palamedes. The acad. at Vienna contains a striking example of his work—a company of gentlefolk rising from dinner.

HALSE, n. *hawlz*, or HAWSE, n. *hawz* [Ger. Dut. *hals*, the neck: Dut. *halsen*, to take one by the neck, to embrace]: in *OE.*, the neck: V. to take one by the neck; to embrace. HALS'ING, imp. HALSED, or HALST, pp. *hawlst*. HAWS'ING, imp. HAWSED, pp. *hawzd*.

HALSE, HALSER: see HAWSE.

HALSTEAD, *hawł'stəd*: market-town of England, co. of Essex, agreeably situated on both banks of the Colne; about 43 m. n.e. of London, on the high-road from that city to Norwich. Its parish church, one of the finest in the county, is in the perpendicular style, with decorated chancel. The chief educational institution is Lady Mary Ramsey's Grammar School, with a small endowment, founded 1594. The manufactures are crape, silk, velvet, and paper; brick-making and straw-plaiting also are carried on. Pop. (1871) 5,783; (1881) 5,804; (1891) 6,056.

HALSTEAD, *hawł'stəd*, MURAT: journalist: b. Paddy's Run, Butler co., O., 1829, Sep. 2. He was bred to farm life, graduated at Farmers' College, near Cincinnati, 1851; became local reporter on the Cincinnati *Enquirer*; established a Sunday newspaper in Cincinnati; began reporting on the Cincinnati *Commercial* 1853, bought an interest in the paper 1854, became editor-in-chief 1856, proprietor 1867, and, on the consolidation of the *Commercial* and the *Gazette* 1882, became pres. of the company and chief editor. Though supporting the policy and measures of the republican party, he has been a fearless, independent writer; and his severe criticisms on some of the party's highest

HALT--HALYBURTON.

leaders caused his rejection by the U. S. senate when nominated by Pres. Harrison to be U. S. minister to Germany 1859, April.

HALT, a. *hawlt* [Goth. *halts*; Icel. *halltr*, lame; Norw. *haltra*, to halt, to go lame]: lame; crippled: N. the act of limping: V. to limp from lameness; to hesitate; to falter. **HALTING**, imp.: ADJ. limping: N. act of one who halts. **HALT'ED**, pp. **HALTER**, n. one who. **HALTINGLY**, ad. -ly.

HALT, v. *hawlt* [Ger. and Sw. *halt*, hold, stop; F. *halte*; OF. *halt*, a halt—connected with above]: to cease marching; to stop; to make a stand: N. a stopping; a stop in marching. **HALT'ING**, imp. **HALT'ED**, pp.

HALTER, n. *hawlt'ēr* [O.H.G. *hulfta*; Dut. *halfter*, a halter: Bav. *halfter*, a pair of braces]: a rope or strap for leading or confining a horse; a rope to hang criminals: V. to bind or catch with a halter. **HALTERING**, imp. **HALTER'ED**, pp. -'ērd.

HALTERES, n. plu. *hāl tē'rēz* [Gr. *haltērēs*, masses of lead held in the hands to balance leapers]: the rudimentary filaments or balancers which represent the posterior pair of wings in the order of insects called the *diptera*.

HALVANS, n. *hāl-rānz*: impure ores which require to be washed and freed from impurities.

HALVE, v. *hāv* [from *half*, which see]: to divide into two equal parts. **HALVING**, imp.: N. a method of joining timbers by letting them into each other. **HALVED**, pp. *hāvd*. **HALVES**, n. *hāvz*, the plu. of *half*: INT. expression by which a person familiarly lays claim to an equal share of a thing. **TO GO HALVES**, to share equally.

HALYARDS, or **HALLIARDS**, n. plu., *hāl'yērdz* [*hale* or *haul*, and *yard*]: the smaller ropes and tackle used in hoisting sails or other portions of a ship's equipment. The signal halyards are running-cords of the best white hemp, passing through a pulley in the truck at the mast-head or gaff-point, and thence to the deck; the flags when attached to them, are rolled up, and then hoisted and expanded to the wind by a jerk when the proper moment arrives.

HALYBURTON, *hāl'z-bēr-ton*, THOMAS: Scotch Presb. clergyman: 1674, Dec. 25—1712. He studied at Rotterdam, then at Perth and Edinburgh and 1692 entered the Univ. of St. Andrews. He was ordained, 1700, in the parish of Ceres, and was appointed 1710 to a professorship of theology in St. Andrews. He was author of several works, including *Natural Religion Insufficient, and Revealed Necessary to Man's Happiness*; *The Great Concern of Salvation*; and *Ten Sermons preached before and after the Celebration of the Lord's Supper*. The works, especially the autobiographic memoir, of the 'Holy Halyburton' were formerly very popular in Scotland, and still are greatly relished by persons of a serious disposition. These books, which are among the best of this class, were published, with an *Essay on his Life and Writings*, by Robert Burns, D.D. (London 1833).

HALYSITES—HAM.

HALYSITES, *n* plu. *hăl'ŷ-sīts* [Gr. *hălŷsīs*, a chain]: in *geol.*, chain-pore coral.

HA'LYS RIV'ER: see **KIZIL TEREK**.

HAM, *n*. *hām* [Icel. *höm*, the back parts or rump: Fin. and Dan. *humma*, or *homme*, a cry to keep a horse quiet, or to make him back—see next entry]: the back part of the thighs. **HAMSTRINGS**, the strong sinews at the back of the knee. **HAM'STRING**, *v*. to cut the strong sinews of the leg, and thus to disable or lame. **HAM'STRINGING**, *imp*. **HAM-STRUNG**, *pp*. *-strång*, disabled by having the strong sinews of the leg cut.

HAM, *n*. *hām* [Bav. *hammen*; Dut. *hamme*, ham; Sp. *jamon*; F. *jambon*, ham—from F. *jambe*, a leg]: properly, the hind part or angle of the knee, but usually applied to the cured thigh of the ox, sheep, or hog, especially the hog. Ham-curing, or, what is the same thing, bacon-curing, is performed in a variety of methods, each country or district having its own peculiar treatment; these, however, relate to minor points. The essential operations are as follows: The meat is first well rubbed with bay-salt, and either left on a bench that the brine may drain away, or covered in a close vessel; after a few days, it is rubbed again, this time with a mixture of salt and saltpetre, to which sugar is sometimes added, or with a mixture of salt and sugar alone. It is then consigned to the bench or tub for at least a week longer, after which it is generally ready for drying. *Wet salting* requires, on the whole, about three weeks; *dry salting*, a week longer. Mutton-hams should not be kept in pickle longer than 12 or 14 days. Some hams are merely hung up to dry without being smoked; others are removed to the smoking-house, which consists of two and sometimes three stories. The fire is kindled in the lowest, and the meat is hung up in the second and third stories, to which the smoke ascends through holes in the flooring. The fire is kept up with supplies of oak or beech chips, though in some districts, as in Westphalia, twigs of juniper, and, in many parts of Great Britain, peat, are used. Fir, larch, and such kinds of wood impart an unpleasant flavor, and are on no account to be used. The fire must be kept smoldering night and day for about six weeks, at the end of which time, if the ham be not more than five or six inches deep, it is perfectly cured. The efficiency of wood-smoke in preserving meat is due to its pyroligneous acid (q.v.): see also **CREASOTE**. Cold weather is preferable for this operation. In regions where wood and peat are used for fuel, hams are smoked by hanging them up inside the large, wide chimneys. Westphalia has long been celebrated for the delicacy and flavor of its smoked hams. The curing of hams has been brought to great perfection in the United States, in establishments where it is done on an immense scale.

HAM, *ŏng*: small town and fortress of France, dept. of Somme, on the river Somme, 36 m. e.s.e. of Amiens, about 70 m. n.n.e. of Paris. It is of ancient origin: coins were struck here in the reign of Charles the

HAM—HAMADAN.

Bald (840-877). The seigniory, or lordship, of Ham, erected into a duchy 1407, was held by the families of Courcy, Orleans, Luxembourg, and Vendome. The town is noteworthy for its old fortress, or castle, built by the Constable de Saint-Pol 1470, and now used as a state prison. Its walls are 39 ft. thick, and its principal tower 108 ft. in height, and the same in diameter. It is memorable as the place of confinement of Marbœuf, Moncey, and others, and, subsequently, of Polignac, Chantelauze, Peyronnet, and Guernon Ranville 1851-36, and of Louis Napoleon, late emperor, 1840-46. After the *coup d'état*, 1851, Dec. 2, the republican generals Cavaignac, Lamoricière, Changarnier, and others were kept here for some time. Pop. 3,500.

HAM, *hām*: second of the three sons of Noah, and brother of Shem and Japheth (Gen. v. 32). The word is derived by Gesenius from the Heb. *Hamam*, 'to be hot.' His descendants are represented in the biblical narrative as peopling the southern regions of the earth—Arabia, the Persian Gulf, Egypt, Ethiopia, Libya, etc. The Coptic, or native, name of Egypt is *Keme* or *Chemī*, sometimes supposed to be the same word as Ham, and signifying both black and hot. In the hieroglyphic language, the name of Egypt is expressed by the two letters K. M. In the Rosetta Inscription, the word is read by Champollion, *Chmé*. This identification is not satisfactory to Lepsius and other authorities, who, while not denying that the term Ham included Egypt (Ps. cv. 23; cvi. 22), view it as having had primarily a much wider application. Modern ethnologists regard the Hamitic races as intruders from Asia, like the Semites (with whom they may originally have been allied), though known to history in Africa only. They differ widely from Negroes, Bantus, Fulahs, and Hottentots. They occupied the Nile Valley, the e coast of Africa, and parts of the Sahara. They include the ancient and modern Egyptians, ancient Libyans, Numidians, and Gaetulians, with the tribes or peoples now speaking Berber or Kabyle dialects, Tuaregs, also Somalis and Gallas. Their languages were or are akin.

HAMADAN, *hā-mā-dān'*: important town of Persia, province of Irak Ajemi, agreeably situated at the n. base of Mount Elwund, 180 m. w.s.w. of Teheran; lat. 34° 50' n., and long 48° 28' e. Its streets are narrow and dirty; but trade and manufactures are extensive. It contains numerous caravansaries, excellent and well-furnished bazaars, gardens, baths and mosques, as well as two notable tombs, one that of the famous Arabian philosopher and physician Avicenna (q.v.), which draws numerous pilgrims to the town; and the other affirmed to be that of Mordecai and Esther. During four months in winter, the cold here is excessive and fuel with difficulty procured; through the rest of the year, the climate is delightful. Being the centre of converging routes from Bagdad, Erivan, Teheran, and Ispahan, it is the seat of a large transit trade. H. has extensive manufactures of leather; coarse carpets, woolen and cotton fabrics also are made. Recent explorers have

HAMADRYAD—HAMANN.

concluded, from historical evidence, and from the coins, inscriptions, and other remains found here, that H. occupies the site of the Median Ecbatana: see ECBATANA. Pop. variously estimated 10,000–40,000.

HAMADRYAD, n. *hām'ā-dri'ād* [L. *hamādryās*—from Gr. *hama*, together; *drus*, an oak]: a wood-nymph attached to a particular tree, and whose existence depended on that of the tree to which she was attached: see NYMPHS.

HAMADRYAS, n. *hām a-dri'as*: in zool., species of the genus *Cynocephalus*: see BABOON.

HAMAH, *hā'mā* (*Hamath* of the Bible; Gr. *Epiphania*): city of Syria, 120 m. n. of Damascus. The town is built on both sides of the Orontes, here crossed by four bridges. A number of huge wheels, turned by the current, raise the water into aqueducts for supply of the town. The town is inclosed by walls, and the houses are built in the Damascus style, of sun-dried bricks and wood. The principal structures are the governor's palace, many mosques, baths, bazaars. There are manufactures of silk, cotton, and woolen fabrics, gold and silver thread. H. ranks among the oldest cities in the world; it was a noted place, and the capital of a little kingdom, when the Israelites came out of Egypt; and its name is of frequent occurrence in the Old Testament. Pop. 30,000.

HAMAMELIS—HAMAMELIDEÆ: see WITCH-HAZEL.

HAMANN, *hā'mān*. JOHANN GEORG: original thinker and author, by some of his friends called the 'Magus of the North': 1730, Aug. 27—1788, June 21; b. Königsberg Prussia, of a humble family. His early life was not fortunate; and a failure to acquit himself creditably in some business with which a friend, a merchant of Riga, had intrusted him, induced him to abandon himself to dissipation, from which he was rescued by reading the Bible. He then studied the ancient languages and Oriental literature, and read many eminent authors. He died at Münster. As an author, H. was little esteemed by the mass of his contemporaries, as he opposed the tendencies of the age, and defended the dignity of revelation against the attacks of the Rationalists, and developed Christian faith into an extreme pietism—thus placing himself in opposition to the multitude of scholars. His language, besides, was figurative and symbolical in the highest degree, and frequently concealed rather than revealed the depth of his thinking. He was also unstable in purpose, unpractical in affairs, and not well capacitated for abstract thought. But his unmistakable genius, and the occasional rich suggestiveness of his ideas, were appreciated highly by Herder, Goethe, Jacobi, Jean Paul, and other great men. His influence on Herder's views was very great. All his writings evince a deeply spiritual faith in the unseen and the eternal. Fragments were published by Cramer, under the title *Sibyllinische Blätter des Magus aus Norden* (Leip. 1819). and his *Sämmtliche Werke*, by F. Roth (7 vols. Berlin 1821–25; an 8th vol., published by G. A. Wiener, Berlin 1843, con-

HAMÂSAH—HAMBLE.

tains additions and explanations). His biography was published by E. H. Childemeister (*Hamann's Leben und Schriften*, 6 vols. 1857-73), and by Poel (2 vols. 1874-76).

HAMÂSAH, *hâ-mâ'sah* (correctly, **HAMÂSEH**): Arabian anthology, named from the title of its first book, and compiled by Habib ibn Aus et-Tai, surnamed Abû Temman. It consists of 10 books, or parts, embracing 884 complete or partial poems, selected from the works of Arab poets from remotest periods till the time of the compiler, though more fully representing the poets of the ante-Islamic time, the early days of El Islam, and of the period A.D. 660-749. The latest date that can be ascribed to any of the poems is A.D. 832. The compiler was a distinguished poet in the style of his day, and noted as a traveller: He is credited with having compiled or composed five poetical works, one of which was the II., while temporarily residing in Hamâdam; and the H. was long held as an heirloom in the family of his host. Many commentaries have been prepared on it, and a skilful and spirited translation into German was published by Friedrich Rückert (Stuttgart 1846). The character of this storehouse of ancient legend will readily appear from the titles of the books, viz: (1) *El-Hamâseh*, 261 pieces; (2) *El-Marâthi* (dirges), 169; (3) *El-Adab* (manners), 54; (4) *En-Nesib* (beauty and love of women), 139; (5) *El-Hijâ* (satires), 80; (6) *El-Adyâf wa-l-Medh* (hospitality and panegyric), 143; (7) *Es-Sifat* (miscellaneous descriptions), 3; (8) *Es-Seyr wa-n-No'as* (journeying and drowsiness), 9; (9) *El-Mulah* (pleasantries), 38; (10) *Medhemmet-en nisâ* (dispraise of women), 18.

HAMATE, a. *hâ'mât* [L. *hamâtus*, hooked, crooked—from *hâmus*, a hook]: hooked; entangled. **HA'MATED**, a. hooked or set with hooks.

HAMBA'TO: see **AMBATO**.

HAMBLE, v. *hâm'bl*, or **HAMMEL**, v. *hâm'mël* [Dut. *hamme*, a shackle for cows: Icel. *hamla*, to restrain: *ham-ladr*, disabled: AS. *hamelan*, to hamstring]: to render dogs unfit for hunting by cutting their feet; to cut the tendons of the legs; to hamstring. **HAM'BLING**, imp. **HAMBLIED**, pp. *hâm'bl'd*. **HAM'MELLING**, imp. **HAM'MELLED**, pp. *-mëld*.

HAMBURG.

HAMBURG, *häm'bürch*: the largest of the former free cities of Germany, and the last to retain the position of a free city—having ceased to be such 1888, Oct. (see **FREE CITIES**). It is in lat. $53^{\circ} 32'$ n., and long. $9^{\circ} 58'$ e.; on the n. bank of the Elbe, at its junction with the small streams of the Alster and the Bille; about 75 m. from the German Ocean. H. was founded by Charlemagne 804, but its commercial history began in the 13th c., when Emperor Frederick I. granted it the free navigation of the Elbe from the city to the sea, with the right of levying a toll on foreign shipping. These privileges were confirmed by his son, Otho IV., who raised H. to the rank of a free city. In 1241, H. joined with Lübeck in the formation of the Hanseatic League (q.v.), and from that time increased rapidly in wealth and commercial importance, augmenting its territory by the purchase of the township of Ritzebüttel, at the mouth of the Elbe (where the harbor of Cuxhaven is now situated), and several villages and islands in the vicinity of the town. Under the protection of the German emperors, H. soon became powerful enough to defend itself and its commerce both by sea and land, and carried on war for a considerable period against the Dutch and the Danes, though with varying success. It early embraced the doctrines of the Reformation, and, in consequence of the vigorous administration of its affairs, never had an enemy within its walls during the stormy period of the Thirty Years' War. The frequently recurring disputes with Denmark ceased 1768, when that power renounced all claim to any portion of the H. territory. The prosperity of the city increased until 1799, when a great commercial crisis occurred, followed 1806 by its occupation by the French, which, with a few interruptions, lasted till 1814. During this period, the town was strongly fortified, it being Napoleon's intention to make H. the stronghold of his power in n. Germany. The sufferings of the citizens were very great, and their losses were estimated at more than \$50,000,000. Their miseries culminated in the siege which the French under Davout sustained from the Russians in the winter of 1813-14, when 30,000 people were driven out of the town, many of whom perished of cold and hunger. In 1815, H. joined the German Confederation, and was favored with a return of its former prosperity until the terrible fire of 1842, by which, within three days, one-third of the city was destroyed, with great loss of life and property. The fire was, however, not an unmixed evil, for advantage was taken of the opportunity to reconstruct that portion of the town, which by its broad, well-lighted, and well-drained streets, and fine and lofty houses, offers a striking contrast to the remaining part, much of which is occupied by wholesale business, and intersected by canals communicating with each other and with the river, by which goods are conveyed in lighters to and from the warehouses. The old ramparts have been converted into gardens and walks, and the beauty of the city is greatly increased by two large sheets of water formed by the Alster, and surrounded by good hotels and

HAMBURG.

private houses, many of which, in the suburb of Uhlenhorst, about two m. from H., are very charming.

There are several fine buildings, of which the exchange—where 4,000 merchants and others meet daily—and the picture-gallery are the principal. Among the churches, the principal are: St. Nicholas's, built from designs by Sir Gilbert Scott, at a cost of \$1,000,000, as a memorial of the fire of 1842, a very fine Gothic building, with one of the loftiest spires in Europe (483 ft.); St. Michael's, built in the 18th c., in the Renaissance style, also distinguished by a lofty spire (432 ft.); and St. Catharine's, interesting from its age, being one of the few churches that escaped the fire.

H. is the commercial emporium of n. Europe, and has recently been connected by bridges across the n. and s. branches of the Elbe with Harburg in Hanover, by which direct railway communication has been obtained with the city of Bremen, and the route to Paris shortened by several hours. Great facilities have been given for the loading and discharging of steamers by the recent construction of extensive quays furnished with steam-cranes, warehouses, and communication by rail with the whole of the continent. Constant efforts are made to deepen the bed of the river, and under favorable circumstances vessels drawing 18 ft. can go up to the harbor at high tide. H. is one of the largest coffee-marts, and, next to London, has the largest money-exchange transactions, in Europe. As a commercial centre, it is surpassed only by London, Liverpool, Glasgow, and New York—being the chief on the continent of Europe. The manufactures of H. are unimportant compared with its commerce, and are estimated not to exceed \$12,125,000 in value per annum. The principal are cigar-making, distilling, sugar-refining, brewing, meat-curing, engineering, iron-founding, ship-building.

The imports have trebled within about 30 years. The value of imports by sea (1890-95) varied from \$344,000,000 to \$395,000,000 a year, of which a value of about \$125,000,000 was from Great Britain, and about \$30,000,000 from the United States. Of total imports, one half comes by sea, the rest by land and by river. During the same years, the number of ships that entered the port ranged from 8,000 to 9,000, with tonnage of from 5,000,000 to 6,000,000; the clearances being about the same in number and burden. About 3,000 of the vessels were under the British flag. The commercial intercourse of the United Kingdom with H. is very important, and embraces about a half of the total British trade with Germany. In 1894, the port possessed 648 vessels, of 664,353 tons, 366 of them being steamers. The tonnage of the mercantile navy of H. is nearly as large as that of the vessels of Holland. Its large steamers maintain direct communication with N. and S. America, the W. Indies, and the ends of the earth. In one year, ships and cargoes to the value of \$500,000,000 have been insured at H. H. is one of the principal emigration ports of Germany, above a quarter of a million persons having sailed thence, 1874-80, bound mostly for the United States.

The charitable institutions are numerous and well en-

HAMBURG-LAKE.

dowed. There are a great many societies and asylums for the relief or reception of various classes, and the poor in general are well cared for. The general hospital has accommodation for 1,800 patients, and there is a smaller hospital in connection with the sailors' home. The Rauhes Haus (q.v.), near H., is very successful in reforming depraved children. There are several excellent schools, including the Gymnasium (founded 1528), a Realschule, a trade-school, a school of navigation, and a school of art. There are two large public libraries, an observatory, botanical and zoological gardens—the latter large, and laid out with great taste; there are also two large and several small theatres, and a great number of public gardens and places of amusement.

In 1866 H. became a member of the N. German Confederation, and is now one of the states of the empire, sending three members to the imperial parliament at Berlin. The township of Bergedorf, 10 m. s.e. from H., formerly held jointly with Lübeck, became the sole property of H. 1868, and the whole territory covers an area of 157 English sq. m. For several years after the restoration of the empire, H. remained a free port as in the time of the Zollverein, the outlying portions of its territory being, as before, without the free-trade limit; but in 1881 negotiations were completed for making H. subject to the same economical conditions as the rest of the empire (part of the city's debt being thrown on the imperial treasury). Although H. retains the management of its local affairs, the independent position formerly held by the republic ceased 1866; consequences of this being the abolition of the H. flag, and the withdrawal of its consular and diplomatic representatives in foreign countries, in addition to compulsory service for three years in the army or navy by all young men liable to military duty. The nominal status of a free city was retained till 1888. The estimated revenue of H. (1902) was \$20,225,000. The imports exclusive of bullion (1885) were \$497,178,000, (1901) \$432,142,200, and exports (1901) \$363,909,400. Pop. of the territory (158 sq. m.) of H. (1875) 388,816; (1880) 453,869; (1885) 471,275; (1890) 323,923; (1900) 705,738.

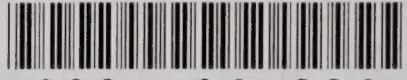
HAMBURG-LAKE, n. *hămb'berg*- [from *Hamburg*, city of Germany]: a crimson or purplish pigment of great power and depth; resembling the cochineal lake, except that it dries with difficulty. HAMBURG-PARSLEY, large-rooted parsley which gives an agreeable flavor to soups and stews. HAMBURG-WHITE, barytes used as a pigment.

HAMELN.

HAMELN, *há'meln*: interesting town, and formerly a fortress of Hanover, in the province of Hanover, Prussia; beautifully situated on a commanding position on the Weser, at the confluence of the Hamel with that river, 25 m. s.w. of Hanover. It is surrounded by a wall, formerly surmounted by 20 towers, and defended by a fort, which, however, was blown up by the French 1806. It is irregularly built, and is full of wooden houses in the old German style; has three churches, including the Münster, a fine old edifice, dated from 1127, and now falling into ruin; and a large educational institution, built 1827. The chain-bridge at H., crossing the Weser, was completed 1839, and is about 780 English ft. in length. The people are employed chiefly in brewing; in the manufacture of paper, cement, woolen goods, and carpets; and in agriculture, salmon-fishing, and general trade. In the earliest times, H. belonged to the Abbey of Fulda, and was a member of the Hanseatic Confederation. Pop. (1880) 10,924; (1890) 13,676.

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